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# **Spatial and Temporal Dynamics of the Incidental Catch of Chinook (*Oncorhynchus tshawytscha*) and Coho (*O. kisutch*) Salmon in Seine and Troll Fisheries in Northern British Columbia: 1982-1985**

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SPATIAL AND TEMPORAL DYNAMICS OF THE INCIDENTAL CATCH OF CHINOOK  
(Oncorhynchus tshawytscha) AND COHO (O. kisutch) SALMON IN SEINE  
AND TROLL FISHERIES IN NORTHERN BRITISH COLUMBIA: 1982-1985

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ABSTRACT

Henderson, M. A., B. Riddell, and R. E. Diewert. 1988. Spatial and temporal dynamics of the incidental catch of chinook (Oncorhynchus tshawytscha) and coho (O. kisutch) salmon in seine and troll fisheries in northern British Columbia: 1982-1985. Can. MS Rep. Fish. Aquat. Sci. 2001: 60 p.

We examined the incidental catch of chinook and coho salmon from 1982 to 1985 in pink and sockeye salmon seine and troll test fisheries in central and northern British Columbia. The use of the term test fisheries refers to vessels that were under charter to the Government of Canada and where the total catch, the location of the catch and the time of the catch were known without error. We then compared the magnitude and seasonal pattern of the incidental catch of chinook and coho salmon from the test fishing vessels with that reported for the commercial fishing fleet in the same areas. There were significant differences among fishing weeks and fishing areas in the CPUE for both chinook and coho salmon as reported by the test fishing vessels. Further, the seasonal pattern of CPUE for chinook and coho was not the same. However, the seasonal pattern of CPUE within each fishing area was generally consistent between years. The chinook salmon CPUE in an outside seine test fishery (approx. 200 km west of the mainland) increased from early June through the end of July and then decreased in August. Conversely, the chinook CPUE from several inside seine test fisheries (located immediately adjacent to the mainland) increased over the month of June and then decreased through September. A third pattern was evident in the troll test fishery where chinook CPUE declined through July and then increased through August. The CPUE of coho in the outside seine test fishery increased over the month of June, remained high through mid-July and then decreased rapidly in August while in the inside fisheries CPUE increased discontinuously from early June through the end of August in most years. There was no consistent seasonal pattern between years for coho CPUE in the troll test fishery.

The overall seasonal patterns of chinook and coho CPUE for the commercial fleet were generally similar to that described above for the test fishing vessels. However, there were often major differences in the relative magnitude and direction of change of CPUE for commercial and test fishing vessels between adjacent weeks. This was likely the result of inaccuracies in the commercial catch statistics. Also, we provide evidence that the commercial catch reporting system probably underestimates the absolute chinook CPUE as the result of inaccuracies in estimates of the catch of smaller fish.

## RÉSUMÉ

Henderson, M. A., B. Riddell, and R. E. Diewert. 1988. Spatial and temporal dynamics of the incidental catch of chinook (*Oncorhynchus tshawytscha*) and coho (*O. kisutch*) salmon in seine and troll fisheries in northern British Columbia: 1982-1985. Can. MS Rep. Fish. Aquat. Sci. 2001: 60 p.

Nous avons examiné les prises accessoires de saumon chinook et de saumon coho de 1982 à 1985 dans les pêches expérimentales effectuées à la senne et à la cuillère pour capturer le saumon rose et le saumon sockeye dans les parties centrale et septentrionale de la Colombie-Britannique. L'expression "pêche expérimentale" renvoie aux bateaux affrétés par le gouvernement canadien et qui permettent de connaître sans risque d'erreur le volume total, le lieu et le moment des prises. Nous avons ensuite comparé l'importance et le schéma saisonnier des prises fortuites de saumon chinook et de saumon coho effectuées par les bateaux de pêche expérimentale avec les mêmes données relevées pour la flotte de pêche commerciale dans les mêmes zones. Selon les relevés effectués par les bateaux de pêche expérimentale, il y avait d'importantes différences d'une semaine à l'autre et d'une zone de pêche à l'autre dans la CPUE à la fois pour le saumon chinook et pour le saumon coho. De plus, le schéma saisonnier de la CPUE n'était pas le même pour le chinook et le coho. Cependant, à l'intérieur de chaque zone de pêche, le schéma saisonnier de la CPUE était généralement uniforme d'une année à l'autre. Pour le saumon chinook, la CPUE au cours d'une pêche expérimentale à la senne effectuée au large des côtes (approximativement 200 km à l'ouest du continent) a augmenté du début juin jusqu'à la fin de juillet, puis a décliné au mois d'août. Par contre, la CPUE enregistrée pour le chinook durant plusieurs sorties de pêche expérimentale effectuées à la senne près des côtes (lieu de pêche immédiatement contigu au continent) a augmenté au cours du mois de juin et a décliné ensuite jusqu'en septembre. Un troisième schéma s'est manifesté dans la pêche expérimentale à la cuillère alors que la CPUE pour le chinook a diminué tout au long du mois de juillet puis augmenté pendant tout le mois d'août. Pour le coho, la CPUE enregistrée durant la pêche expérimentale effectuée à la senne au large des côtes a augmenté pendant le mois de juin, est restée élevée jusqu'à la mi-juillet, puis s'est mise à diminuer rapidement au mois d'août. En revanche, dans les pêches effectuées près des côtes, la CPUE a augmenté de façon discontinue depuis le début de juin jusqu'à la fin d'août la plupart des années. Dans le cas du coho, il n'y avait pas de schéma saisonnier uniforme d'une année à l'autre pour la CPUE enregistrée durant la pêche expérimentale à la cuillère.

Pour le chinook et le coho, les schémas saisonniers globaux de la CPUE obtenue par la flotte commerciale étaient généralement semblables à ceux que nous avons décrits ci-dessus à propos des bateaux de pêche expérimentale. Cependant, il y avait souvent des différences notables dans l'importance relative et la direction du changement de la CPUE pour les bateaux de pêche commerciale et ceux de la pêche expérimentale entre des semaines pourtant proches l'une de l'autre. Cela tenait probablement à des inexactitudes dans les statistiques concernant les prises commerciales. Nous montrons également que le système de comptes-rendus sur les prises commerciales sous-estime probablement la CPUE absolue pour le chinook en raison d'une estimation inexacte des captures de plus petits poissons.



## 1.0 INTRODUCTION

The five species of Pacific salmon (Oncorhynchus spp.) are harvested in commercial gillnet, seine and troll fisheries, sport fisheries and Indian food fisheries in Canada. Generally, these fisheries operate by directing effort at one species or one stock of one species at any given time. However, as a result of an overlap in the distribution of the different species of Pacific salmon in space and time, the catch almost always consists of several species and stocks. The catch of species or stocks that are not the target of the fishery is often referred to as an incidental catch or a by-catch. An incidental catch of salmon is a characteristic of both high seas (Harris 1987) and coastal salmon fisheries (Sprout and Kadowaki 1987).

The incidental catch of salmonids poses important problems for the manager. First, the incidental catch can come from stocks that are less productive than the target stock. This may lead to over-exploitation of the stocks contributing to the incidental catch. Secondly, it is usually difficult to determine the stock of origin of incidentally caught fish. As a result uncertainty is generated in estimates of the total run size and productivity for many stocks. Finally, the accuracy of the catch reporting system for the commercial fleet is unknown. For example, there may be errors in reporting the amount of catch by species particularly for non-target species and in some cases the catch of non-target species may not be reported at all. This latter point is particularly important as currently there is no means of deriving a catch estimate by species that is independent of the commercial catch reporting system. The first step in determining the magnitude of these problems is to quantify the temporal and spatial dynamics of the incidental catch.

A large scale adult salmon tagging program took place in the coastal waters of central and northern British Columbia and southern southeast Alaska from 1982 to 1985. The primary purpose of the program was to determine the stock composition of pink (Oncorhynchus gorbuscha) and sockeye (O. nerka) salmon caught in commercial fisheries operating in this area. Commercial seiners and trollers under contract to the Government of Canada and the State of Alaska were used to catch the salmon for tagging. Personnel responsible for carrying out the tagging aboard each of the vessels also recorded the total catch of each species taken in each set or tack.

The purpose of this report is to describe the temporal and spatial dynamics of the incidental catch of chinook (Oncorhynchus tshawytscha) and coho (O. kisutch) salmon taken by the tagging vessels by year and fishing area (estimates of the incidental catch of other salmonids are provided in the appendices). We then make inferences regarding the size distribution of fish in the incidental chinook catch from the tagging vessels, and finally compare seasonal rates of incidental chinook and coho salmon catches between tagging vessels and the commercial fleet.

## 2.0 METHODS

All fish were caught by commercial seiners and trollers using commercial salmon fishing gear. Records were kept of the date, time, and location of each individual fishing operation (ie. set for seiner; tack for troller). At the end of each set the number of salmonids of each species was recorded and those of interest were tagged and released. Catches of chinook and coho were determined for each set made by a tagging vessel and then an average calculated by statistical week and area. Only records of catches made in Canadian waters were dealt with in this study. Areas of the north coast of British Columbia fished by the tagging vessels are shown in Fig. 1.

The tagging program in 1984 and 1985 was designed to provide estimates of the stock composition of pink salmon caught in fisheries in central and northern British Columbia and southern southeast Alaska. Consequently, the skippers of the tagging vessels were directed to fish in such a way as to maximize their catch of pink salmon and thus mimic a directed commercial pink salmon fishery. The focus of the tagging operation in 1983 was sockeye salmon and in this case the skippers were directed to maximize their catch of sockeye salmon. In 1982, both pink and sockeye salmon were tagged for the purpose of determining stock composition. For this year the skippers were directed to fish as they would in a commercial fishery. The seiners used for the tagging operations fished in Canadian Department of Fisheries and Oceans statistical areas 3, 4 and 5 from 1982 to 1985. In addition, seiners operated in statistical area 1 in 1982 and 1983 and in statistical areas 1 and 6 in 1985. Fishing operations from seiners generally occurred one or two days immediately before or after a commercial opening. They did not occur during a commercial opening. Commercial trollers were used to catch fish in statistical area 1 for the purpose of tagging in 1982, 1984 and 1985. In all cases the tagging vessels fished only in those areas utilized by the commercial fishery. More detailed information on the operation of the tagging vessels is available in Gazey et al. 1983, English et al. 1984 and 1985 and Taylor et al. 1986.

Catch statistics for chinook and coho salmon caught incidentally in commercial seine fisheries along the central and north coast of British Columbia were obtained from the Pacific Region Salmon Catch Statistics Data Base (Wong 1982). Estimates of the average catch-per-unit-effort (CPUE) for the commercial seine fleet by statistical week and area were determined by dividing the total catch (chinook or coho) for a statistical week by the total number of boat days (effort) for the same period. Estimates of boat days were based on counts made by fisheries officers on the fishing grounds. Commercial sales slips that are used to generate the catch data base have categories for chinook of under 1.10 kg (2.42 lb), 1.10 to 2.64 kg (5.81 lb) and greater than 2.64 kg round weight (hereafter referred to as small, medium and large chinook respectively). These weight ranges were used to apportion the total commercial chinook catch into the three size categories by year, week and statistical area.

Comparisons of the incidental CPUE of chinook and coho salmon by the seine tagging vessels between statistical areas and time periods within a year were made using two-way analysis of variance techniques (Statgraphics STSC Inc.). For the analyses, statistical areas and time periods within a year were the

treatments. Because of differences in areas sampled and timing of sampling between years, a separate analysis of variance was performed for each species and year combination. One-way analysis of variance was used to determine the significance of seasonal changes in the incidental chinook and coho salmon CPUE for trollers used in the tagging program in statistical area 1.

The CPUE data for all area and week combinations followed a Poisson distribution. Consequently, a square root transformation was applied to the CPUE data prior to analyses to make the variance independent of the mean.

### 3.0 RESULTS

#### 3.1 CHINOOK

##### 3.1.1 INCIDENTAL CHINOOK CPUE BY THE TAGGING VESSELS

###### 3.1.1.1 SEINE

The statistical analyses of the effects of week (time strata), statistical area (space strata) and their interaction on the incidental chinook CPUE were restricted to times and areas of continuous sampling within each year (ie. the maximum size of the total data matrix that contained no missing cells). Similarly, because of the discontinuity in times and areas of sampling between years the analyses were conducted on an annual basis. This corresponds to the following samples:

| Year | Statistical Areas | Time                |
|------|-------------------|---------------------|
| 1982 | 1,3,4,5           | June 15 - August 3  |
| 1983 | 1,3,4             | June 8 - August 10  |
| 1984 | 3,4,5             | June 29 - August 24 |
| 1985 | 1,3,4,5,6         | June 29 - July 27   |

Generally the week, area and interaction effects were significant ( $P < .05$ ) for each year (Table 1). The single exception was the time effect in 1985. The lack of significance in this case was the result of the small portion of the total time period considered in the analysis. The interaction term is a measure of the degree of difference in the seasonal pattern of incidental chinook catch between areas. The significance of the interaction effect is to a large extent the result of the difference in seasonal patterns in the incidental chinook CPUE between statistical area 1 (Fig. 2) and all other areas (Fig. 3-6). A composite picture of the incidental chinook CPUE for statistical area 1 for all years shows a CPUE that increases discontinuously from early June through the end of July and then declines in August. This is most evident in 1982 when the period of sampling was the longest. Conversely, in statistical areas 3, 4, 5 and

6 there was a pattern of increasing incidental chinook CPUE from early June to the end of June or early July followed by a discontinuous decrease through early September.

Considerable variation in the absolute incidental chinook CPUE was observed between years within all statistical areas (Fig. 2-5). All areas sampled for more than one year, had the largest average CPUE in 1982 and the smallest in 1984. A comparison between areas showed that the largest average CPUE was in statistical area 3 for all years. The smallest estimates of CPUE were generally from statistical areas 1 and 4.

#### 3.1.1.2 TROLL

One-way analysis of variance revealed a significant difference ( $P < .05$ ) in the seasonal CPUE for chinook salmon taken incidentally in statistical area 1 by the troll tagging vessels in 1982 and 1984 but not in 1985 (Table 3). The periods covered were July 13 to August 24, July 6 to August 24 and July 6 to August 17 for 1982, 1984 and 1985 respectively. The incidental chinook CPUE in the troll fishery was similar in 1982 and 1984 (Fig. 7). When the two years are combined they show a CPUE that declines from early July through late July and subsequently increases through late August. The 1985 estimate of chinook salmon CPUE was very low throughout the season except for one period at the end of July. It is interesting that this period, around July 30, corresponds to the secondary maximum in CPUE observed in 1982 and 1984.

#### 3.1.2 INCIDENTAL CHINOOK CPUE BY COMMERCIAL FISHING VESSELS

The overall seasonal patterns of chinook salmon CPUE for the commercial seine fleet were generally the same as described above for the seine vessels involved in the tagging program. However, there were some exceptions and in some instances the duration of the commercial fishery was so short that a comparison was not possible. Although the overall patterns were similar, the relative fluctuations in CPUE between adjacent weeks for the tagging and commercial vessels often did not coincide. A composite picture of the statistical area 1 commercial seine chinook CPUE from 1982 to 1985 showed an increase beginning with the start of the fishing season in early to mid-July, reaching a maximum any time between late July to late August and subsequently declining rapidly (Fig. 8). Qualitatively, this is the same pattern of incidental chinook CPUE observed in the tagging vessels (Fig. 2). The largest CPUE in 1982 for both commercial and tagging vessels was observed in late July. However, in 1983 there was no apparent common trend in CPUE of commercial and tagging vessels over the time period both were operating (mid-July through early August). It is not possible to compare the trends from commercial and tagging vessels in 1985 due to the very short period of time when both vessel types were operating.

The general pattern of decreasing chinook CPUE over the months of July and August that was observed from the tagging seine vessels fishing in statistical areas 3, 4, 5 and 6 was only clearly evident in the commercial operations in

statistical area 3 (Fig. 9-12). Further, in all statistical areas, the variability in chinook CPUE between weeks appears to be greater in estimates obtained from the commercial vessels than those from the tagging vessels.

As observed for estimates of chinook CPUE from the tagging vessels, there was considerable variation in estimates of absolute chinook CPUE between years in all areas from commercial vessels. However, unlike the results from the tagging vessels, the largest average chinook CPUE's were not consistently recorded in 1982 in the commercial operations. In fact, only in statistical areas 3 and 6 were the largest commercial CPUE's recorded in 1982.

The incidental chinook catch in the statistical area 1 commercial seine fishery consisted primarily of large fish in each year from 1982 through 1985 (Fig. 8) based on grading of the catch by processors. However, in all other statistical areas, small chinook salmon made up the majority of the incidental catch. This difference combined with the differing pattern of seasonal incidental chinook CPUE between statistical area 1 and the other statistical areas strongly suggests that the stock complex harvested in the statistical area 1 fishery is not the same as that harvested in the other fisheries.

### 3.2 COHO

#### 3.2.1 INCIDENTAL COHO SALMON CPUE BY THE TAGGING VESSELS

##### 3.2.1.1 SEINE

The statistical analyses of the effects of week, statistical area and their interaction on the incidental coho salmon CPUE were restricted to the areas and periods described above for chinook salmon. Week, area and interaction effects were significant ( $P < .05$ ) for each year (Table 2).

The seasonal pattern of incidental coho salmon CPUE from the tagging seine vessels was different from that described for chinook. The incidental coho CPUE in statistical area 1 increased over the period from mid-June to early July (Fig. 13). The CPUE generally remained high in early and mid-July and then began to decrease rapidly through the termination of sampling in August. The seasonal pattern of the incidental coho CPUE in statistical areas 3, 4, 5 and 6 was approximately the reverse of that described for chinook salmon in the same locations (Fig. 14-17). In all four areas there was a general trend toward an increasing coho salmon CPUE from the beginning of the sampling period in early to mid-June. In each of the four areas there was evidence for a decrease in the coho CPUE later in the season in some years. In statistical area 3 the incidental coho catch began to decline in early August in 1983 and 1985. The same pattern was observed in statistical area 4 in 1984 and 1985 and in statistical area 5 in 1982 and 1984 although the trend toward decreasing CPUE in these latter two areas began later in the season. The coho salmon CPUE did however clearly

exhibit an increasing trend through the month of August in 1982 and 1984 in statistical area 3, in 1982 in statistical area 4 and in 1985 in statistical area 5.

Over the entire season, coho salmon incidental catches were on average greatest in 1983 in all statistical areas. A comparison between areas revealed that the largest estimates of CPUE were usually for statistical areas 1 and 3.

### 3.2.1.2 TROLL

One-way analysis of variance revealed a significant difference ( $P < .05$ ) in the seasonal CPUE of incidentally caught coho salmon in the statistical area 1 troll fishery in 1982, 1984 and 1985 (Table 3). The periods covered by the analysis were the same as those reported above for chinook salmon taken in the statistical area 1 troll fishery. The incidental coho salmon CPUE in the statistical area 1 troll fishery showed no obvious similarity in pattern between years (Fig. 18). Also, there was no similarity between the seasonal CPUE estimates from the troll and seine tagging operations in statistical area 1. In 1982 the CPUE increased from mid-July through late August while over the same time period, the reverse trend was evident in 1985. There was no overall trend in 1984.

### 3.2.2 INCIDENTAL COHO SALMON CPUE BY COMMERCIAL FISHING VESSELS

An annual comparison of the coho salmon CPUE for tagging and commercial seine vessels revealed a situation similar to that observed for chinook salmon. For most year and area combinations where there was sufficient overlap in the operation of the commercial and tagging vessels, the coho salmon CPUE followed the same general trend. However, there were some exceptions, and as well, the weeks with the highest and lowest CPUE for the two vessel types did not always coincide.

The statistical area 1 commercial seine fishery generally did not begin until mid-July. This is the same period when the coho CPUE from the tagging seine vessels began to steadily and rapidly decline (Fig. 13). The commercial seine CPUE showed the same general pattern although the decline did not begin until late July in 1984 (Fig. 19). The commercial fleet also showed a second CPUE maximum in mid to late August in two of the three years (1983 and 1985). However, the tagging seine vessels were not fishing during this later time period.

The coho salmon CPUE from commercial vessels fishing in statistical areas 3, 4, 5 and 6 (Fig. 19 and 20) exhibited a seasonal pattern similar to that observed for the tagging vessels. In general, the commercial CPUE showed a discontinuous increase over the season and in some years declined in August. Despite the overall similarity in the seasonal pattern between tagging and commercial vessels when all years were viewed together, there was little consistency in relative changes in seasonal or weekly CPUE patterns between the two types of operations. This is most easily seen in a comparison of tagging (Fig. 14) and

commercial (Fig.19) CPUE's for statistical area 3. The tagging vessels exhibited CPUE's that continued to increase through early September in 1982 and 1984 but that began to decrease in early August in 1983 and 1985. However, CPUE's from the commercial vessels began to decline in mid to late August in 1982 and 1984. Further, in contrast to the pattern from the tagging vessels, the commercial coho CPUE increased through the end of the season in 1985 while in 1983 the commercial CPUE declined as was the case in the tagging vessel estimates but the decline witnessed in the commercial CPUE began two weeks after it was first observed by tagging vessels.

### DISCUSSION

There are clear differences in the CPUE patterns of chinook and coho salmon between the outside seine fishery in statistical area 1 and the inside seine fisheries in statistical areas 3, 4, 5 and 6 as reflected in CPUE's for the tagging vessels. The CPUE of chinook in the outside fishery increased from early June through the end of July and then decreased through the end of August (Fig. 2). Conversely, the chinook salmon CPUE in the inside fisheries reached a maximum early in the season, often in June, and then decreased through the end of August (Fig. 3-6). Coho salmon CPUE from the outside seine fishery increased from early June through early to mid-July and then decreased over the remainder of the season while the CPUE in the inside fisheries generally increased over the entire season, occasionally decreasing in late August. The differences in the seasonal incidental CPUE patterns for both species between areas are quite consistent over the years examined in this study.

The differences described above suggest that the inside and outside fisheries are probably harvesting different stock complexes. This is further supported by an examination of the relative proportion of different sizes of chinook salmon harvested in the inside and outside fisheries. The incidental catch of chinook salmon in the outside commercial seine fishery was composed primarily of large fish in all four years (Fig. 8). Conversely, the catch of chinook salmon in the inside fisheries consisted primarily of small fish (Figs. 9-12). Others have noted a general increase in the size of chinook salmon as you move from the southern to the northern coastal waters of British Columbia (see Healey 1986 for a review ). However, the comparisons have been made on a large geographic scale (eg. north coast vs. central coast vs. south coast) and do not show the variation that exists within the various statistical areas along the north coast of British Columbia.

Nagtegaal et al. (1988) estimated the number of chinook salmon incidentally caught in the Johnstone Strait sockeye seine fishery in British Columbia in 1986. Their study was independent of the sales slip process which records the fish sold indicating the number of each species caught. They relied on observing a subset of seine sets in the area and then using the information from these observations to estimate the total chinook salmon catch by size category. They noted that the total chinook catch from their estimate was approximately 4.9 times that produced from the sales slips. Almost all the difference could be accounted for by an apparent under-reporting of the catch of juveniles which

were defined as fish less than 2.2 kg in their study. There was no noticeable difference between their estimate and the sales slip estimate of the catch of adults (ie. >2.2 kg.). Although we do not have independent estimates of the total incidental chinook salmon catch by size category, we suspect under-reporting of the catch of smaller chinook is also a characteristic of the north coast seine fisheries. This probably occurs for two reasons. First, small or sub-legal sized chinook salmon may be discarded by the fishermen. Also, they may be sold inadvertently as other species, particularly as pink salmon. Whatever the reason, the effect of under-reporting of small chinook salmon should not alter the seasonal trends in the CPUE observed for the north coast fisheries in this study. Further, it will have little impact on the total chinook CPUE for the statistical area 1 seine fishery as most of the fish taken at this location are large (Fig. 8). However, it is likely that the under-reporting of small chinook salmon in the inside fisheries leads to significant underestimations of the total chinook CPUE as the total catch at these locations consists primarily of small fish (Fig. 9-12). For example, a comparison of the maximum chinook salmon CPUE's of the seine tagging vessels in statistical areas 1 and 3 (Fig. 2 and 3) shows that the CPUE estimates were always larger in statistical area 3. However, the same comparison for the commercial CPUE's shows the reverse pattern (Fig. 8 and 9) with the largest CPUE's being recorded in statistical area 1. Knowing that the estimates of CPUE from the tagging vessels are made essentially without error, we suspect the differences observed between the commercial and tagging vessels are the result of an under-reporting of the catch of small chinook salmon in the north coast commercial fisheries.

Further evidence for the partial discreteness of chinook stocks harvested in the inside and outside fisheries comes from tagging studies. Healey and Groot (1987) noted that most recaptures of chinook salmon tagged in the inside waters of British Columbia were made in the inside waters while recaptures of chinook salmon tagged in the outside waters were made over a much larger geographic area. If this applies to the north coast of British Columbia, then chinook caught in the seine fisheries in statistical areas 3, 4, 5 and 6 would originate primarily from north coast spawning stocks. Chinook salmon caught in the statistical area 1 seine fishery would however be represented by stocks from a much wider geographic area. Finally, as reported in the introduction, the results of our study were part of a much larger program the objective of which was to estimate the interception rate of Canadian and U.S. origin pink and sockeye salmon in fisheries in northern British Columbia and southern southeast Alaska. This was accomplished by tagging large numbers of adult pink and sockeye salmon in the fisheries of concern and subsequently recovering the tags in other fisheries and spawning areas. As part of this program, several hundred chinook salmon were also tagged. The objective of the chinook tagging was to provide a qualitative description of which major British Columbia chinook stocks are harvested incidentally in pink and sockeye salmon fisheries in northern British Columbia. A total of 594 chinook salmon were tagged in all fisheries in 1982, the year for which we have the most information (M. Henderson and B. Riddell, Canadian Department of Fisheries and Oceans, Vancouver, unpublished data). Approximately half of the tags were placed on chinook salmon in the statistical area 1 seine fishery and the remainder on chinook caught in the inside fisheries. Although tag recoveries were made throughout British Columbia and southeast Alaska our focus here will be restricted to the tags recovered in

statistical areas 3 and 4 combined and those recovered off the west coast of Vancouver Island. Of the 43 tags recovered that were placed on in the inside fisheries, 70% were recovered in statistical areas 3 and 4 and 5% were recovered off the west coast of Vancouver Island. However, of the 25 tags recovered that were placed on in statistical area 1, 36% were from the west coast of Vancouver Island and only 8% from statistical areas 3 and 4. The recovery of chinook salmon tags was not part of a random tag recovery program where one knows the number of fish examined for tags in various areas. Nor were the recoveries scaled to total fishing effort. As a result the information cannot be used to estimate the proportion of different chinook salmon stocks harvested in the inside and outside fisheries. However, the large number of recoveries of chinook salmon on the west coast of Vancouver Island that were tagged in statistical area 1 and the small number of recoveries of fish tagged in the inside fisheries that were recovered on the west coast of Vancouver Island in conjunction with the differences in the size distribution and seasonal catch patterns between the inside and outside fisheries strongly suggests that the seine fishery in statistical area 1 is harvesting a different stock complex than the fisheries in statistical areas 3, 4, 5 and 6. In particular, the stock complex in the vicinity of the statistical area 1 fishery probably consists of a much larger proportion of chinook salmon originating from the south coast of British Columbia than the stock complex found in the vicinity of the inside fisheries.

The argument presented above is consistent with available data pertaining to the origin of chinook caught in inside and outside fisheries in northern British Columbia. However, it is possible that the argument has more relevance to maturing adult chinook than it does to younger age classes. In particular, a large portion of the younger chinook caught in the inside fisheries may originate from stocks on the central and south coasts of British Columbia, including the west coast of Vancouver Island. Although some of these fish may have been caught and tagged in our study if present in the vicinity of the inside fisheries, they would, because of their age, not be recovered in spawning areas or approaches to spawning areas during the duration of our tag recovery program.

Comparisons of the overall seasonal trend in CPUE's for chinook and coho salmon between tagging and commercial seiners within a statistical area and year were generally similar. However, there were major differences in relative changes in CPUE's between weeks within years and areas for the two types of operations. Further, the seasonal variability in CPUE estimates were usually greater for the commercial operations. We believe the CPUE estimates from the tagging seiners are more accurate than those derived from the commercial operations and, to the extent that CPUE is an index of abundance, provide a better estimate of the number of fish in an area at any given time. We believe this to be true despite the much smaller sample size from the tagging vessels. As described above, the estimates of catch and effort from the tagging vessels were made essentially without error. However, this is not the case for the commercial operations. The opening of the commercial fisheries on the north coast are often split so that fishing is permitted for one or more days at the beginning of the week (ie. Sunday) and one day toward the end of the week. Often the catch taken by commercial fisherman during the second opening is landed and reported as being

caught in the following week (L. Jantz, Canadian Department of Fisheries and Oceans, Prince Rupert, pers. comm.). As a result, this introduces a source of error in the weekly estimates of commercial catch. The second major source of error in the determination of commercial CPUE is related to how estimates of effort are derived. Generally an overflight is made on the first day of an opening and the number of vessels are counted. On subsequent days of an opening, fishery officers revise the overflight count based on observations made from patrol vessels (L. Jantz, pers. comm.). Both techniques probably produce a considerable amount of error in the effort estimates. They are very dependent on weather conditions, the ability of a fishery officer to cover the entire area open to fishing, the changing dynamics of the fishing fleet and the subjective understanding of the relationship between the counts made from overflights and those made from patrol vessels.

It has become increasingly important in recent years for fisheries managers to understand the spatial and temporal dynamics in the catch of chinook and coho salmon both in fisheries that direct their effort on these species as well as fisheries that direct their effort toward other species of Pacific salmon. Such an understanding is essential for determining the status of British Columbia chinook and coho salmon stocks. This information is also a prerequisite for evaluating the impact of proposed changes in the operation of fisheries on chinook and coho salmon stocks. Finally, it is a necessary piece of information for programs designed to generate accurate absolute estimates of the catch of chinook and coho salmon. Until recently though, detailed information on the temporal and spatial dynamics in the catch of chinook and coho salmon was not available. However, Healey's (1986) study which provides a description of the composition of the catch of troll fishing vessels from throughout British Columbia based on log book records in conjunction with the study of Nagtegaal et al. (1988) which describes the seasonal dynamics of the incidental chinook salmon catch in purse seine fisheries in Johnstone Strait and Juan de Fuca Strait and our study provide much of the necessary information. In particular, it is now possible for managers to consider quantitatively the impact of altering the operation of many British Columbia fisheries with the objective of changing the overall chinook or coho salmon catch or changing the mean size of individuals in the catch. The most important remaining information need in this regard is a description of the temporal and spatial dynamics in the incidental catch of chinook and coho salmon in the large pink and chum salmon seine fisheries along the central coast of British Columbia in statistical areas 7 and 8.

#### ACKNOWLEDGEMENTS

We would like to thank the many people involved in various aspects of this study and particularly those from LGL Ltd., Sidney, British Columbia who coordinated and implemented field aspects of the program.

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Table 1. Analysis of variance statistics for the effects of week and statistical area on the incidental catch of chinook salmon in northern British Columbia seine fisheries from 1982 to 1985 (see text for details).

| Source of Variation | Sum of Squares | d.f. | Mean Square | F-ratio | Sig. Level |
|---------------------|----------------|------|-------------|---------|------------|
| 1982                |                |      |             |         |            |
| MAIN EFFECTS        | 242.35386      | 9    | 26.928207   | 17.402  | .0000      |
| Week                | 212.09010      | 6    | 35.348351   | 22.844  | .0000      |
| Area                | 61.99113       | 3    | 20.663708   | 13.354  | .0000      |
| INTERACTION         | 202.76248      | 18   | 11.264582   | 7.280   | .0000      |
| Week and Area       |                |      |             |         |            |
| RESIDUAL            | 1391.0952      | 899  | 1.5473806   |         |            |
| TOTAL (CORR.)       | 1836.2115      | 926  |             |         |            |
| 1983                |                |      |             |         |            |
| MAIN EFFECTS        | 277.05287      | 10   | 27.705287   | 35.324  | .0000      |
| Week                | 206.56151      | 8    | 25.820188   | 32.920  | .0000      |
| Area                | 41.55854       | 2    | 20.779270   | 26.493  | .0000      |
| INTERACTION         | 41.880449      | 16   | 2.6175280   | 3.337   | .0000      |
| Week and Area       |                |      |             |         |            |
| RESIDUAL            | 480.79315      | 613  | .7843281    |         |            |
| TOTAL (CORR.)       | 799.72647      | 639  |             |         |            |
| 1984                |                |      |             |         |            |
| MAIN EFFECTS        | 49.412754      | 9    | 5.490306    | 11.040  | .0000      |
| Week                | 22.707310      | 7    | 3.243901    | 6.523   | .0000      |
| Area                | 37.435513      | 2    | 18.717756   | 37.639  | .0000      |
| INTERACTION         | 13.290716      | 14   | .9493368    | 1.909   | .0251      |
| Week and Area       |                |      |             |         |            |
| RESIDUAL            | 148.19454      | 298  | .4972971    |         |            |
| TOTAL (CORR.)       | 210.89801      | 321  |             |         |            |
| 1985                |                |      |             |         |            |
| MAIN EFFECTS        | 33.527095      | 7    | 4.7895850   | 4.651   | .0001      |
| Week                | 4.799294       | 3    | 1.5997647   | 1.553   | .2019      |
| Area                | 27.966526      | 4    | 6.9916314   | 6.789   | .0000      |
| INTERACTION         | 45.912343      | 12   | 3.8260286   | 3.715   | .0000      |
| Week and Area       |                |      |             |         |            |
| RESIDUAL            | 214.21708      | 208  | 1.0298898   |         |            |
| TOTAL (CORR.)       | 293.65651      | 227  |             |         |            |

Table 2. Analysis of variance statistics for the effects of week and statistical area on the incidental catch of coho salmon in northern British Columbia seine fisheries from 1982 to 1985 (see text for details).

| Source of Variation | Sum of Squares | d.f. | Mean Square | F-ratio | Sig. Level |
|---------------------|----------------|------|-------------|---------|------------|
| 1982                |                |      |             |         |            |
| MAIN EFFECTS        | 564.73003      | 9    | 62.74778    | 34.043  | .0000      |
| Week                | 46.87098       | 6    | 7.81183     | 4.238   | .0003      |
| Area                | 487.11218      | 3    | 162.37073   | 88.093  | .0000      |
| INTERACTION         | 441.98307      | 18   | 24.554615   | 13.322  | .0000      |
| Week and Area       |                |      |             |         |            |
| RESIDUAL            | 1657.0162      | 899  | 1.8431770   |         |            |
| TOTAL (CORR.)       | 2663.7292      | 926  |             |         |            |
| 1983                |                |      |             |         |            |
| MAIN EFFECTS        | 450.41318      | 10   | 45.04132    | 15.323  | .0000      |
| Week                | 180.13689      | 8    | 22.51711    | 7.660   | .0000      |
| Area                | 250.03533      | 2    | 125.01766   | 42.531  | .0000      |
| INTERACTION         | 586.68730      | 16   | 36.667956   | 12.474  | .0000      |
| Week and Area       |                |      |             |         |            |
| RESIDUAL            | 1910.6553      | 650  | 2.9394697   |         |            |
| TOTAL (CORR.)       | 2947.7558      | 676  |             |         |            |
| 1984                |                |      |             |         |            |
| MAIN EFFECTS        | 96.112906      | 9    | 10.679212   | 9.167   | .0000      |
| Week                | 66.661492      | 7    | 9.523070    | 8.174   | .0000      |
| Area                | 7.949485       | 2    | 3.974742    | 3.412   | .0343      |
| INTERACTION         | 34.812450      | 14   | 2.4866036   | 2.134   | .0103      |
| Week and Area       |                |      |             |         |            |
| RESIDUAL            | 347.17044      | 298  | 1.1650015   |         |            |
| TOTAL (CORR.)       | 478.09580      | 321  |             |         |            |
| 1985                |                |      |             |         |            |
| MAIN EFFECTS        | 66.405901      | 7    | 9.486557    | 8.495   | .0000      |
| Week                | 15.711997      | 3    | 5.237332    | 4.690   | .0034      |
| Area                | 49.122642      | 4    | 12.280660   | 10.997  | .0000      |
| INTERACTION         | 40.067092      | 12   | 3.3389244   | 2.990   | .0007      |
| Week and Area       |                |      |             |         |            |
| RESIDUAL            | 232.28067      | 208  | 1.1167340   |         |            |
| TOTAL (CORR.)       | 338.75366      | 227  |             |         |            |

Table 3. Analysis of variance statistics for the effects of catch week on the CPUE of chinook and coho salmon for troll tagging vessels in statistical area 1 in 1982, 1984 and 1985

| Source of Variation | Sum of Squares | d.f. | Mean Square | F-ratio | Sig. Level |
|---------------------|----------------|------|-------------|---------|------------|
| <b>CHINOOK</b>      |                |      |             |         |            |
| 1982                |                |      |             |         |            |
| Between Groups      | 11.876270      | 5    | 2.3752540   | 9.173   | .0000      |
| Within Groups       | 94.767191      | 366  | .2589268    |         |            |
| TOTAL (CORR.)       | 106.64346      | 371  |             |         |            |
| 1984                |                |      |             |         |            |
| Between Groups      | 9.16504        | 6    | 1.5275068   | 3.423   | .0026      |
| Within Groups       | 176.26899      | 395  | .4462506    |         |            |
| TOTAL (CORR.)       | 185.43403      | 401  |             |         |            |
| 1985                |                |      |             |         |            |
| Between Groups      | 1.610995       | 4    | .4027488    | 1.144   | .3464      |
| Within Groups       | 18.312882      | 52   | .3521708    |         |            |
| TOTAL (CORR.)       | 19.923877      | 56   |             |         |            |
| <b>COHO</b>         |                |      |             |         |            |
| 1982                |                |      |             |         |            |
| Between Groups      | 26.95879       | 5    | 5.3917577   | 6.021   | .0000      |
| Within Groups       | 327.72848      | 366  | .8954330    |         |            |
| TOTAL (CORR.)       | 354.68727      | 371  |             |         |            |
| 1984                |                |      |             |         |            |
| Between Groups      | 31.54360       | 6    | 5.2572666   | 7.355   | .0000      |
| Within Groups       | 282.35423      | 395  | .7148208    |         |            |
| TOTAL (CORR.)       | 313.89783      | 401  |             |         |            |
| 1985                |                |      |             |         |            |
| Between Groups      | 12.872031      | 4    | 3.2180077   | 3.976   | .0069      |
| Within Groups       | 42.083940      | 2    | 0.8093065   |         |            |
| TOTAL (CORR.)       | 54.955971      | 56   |             |         |            |

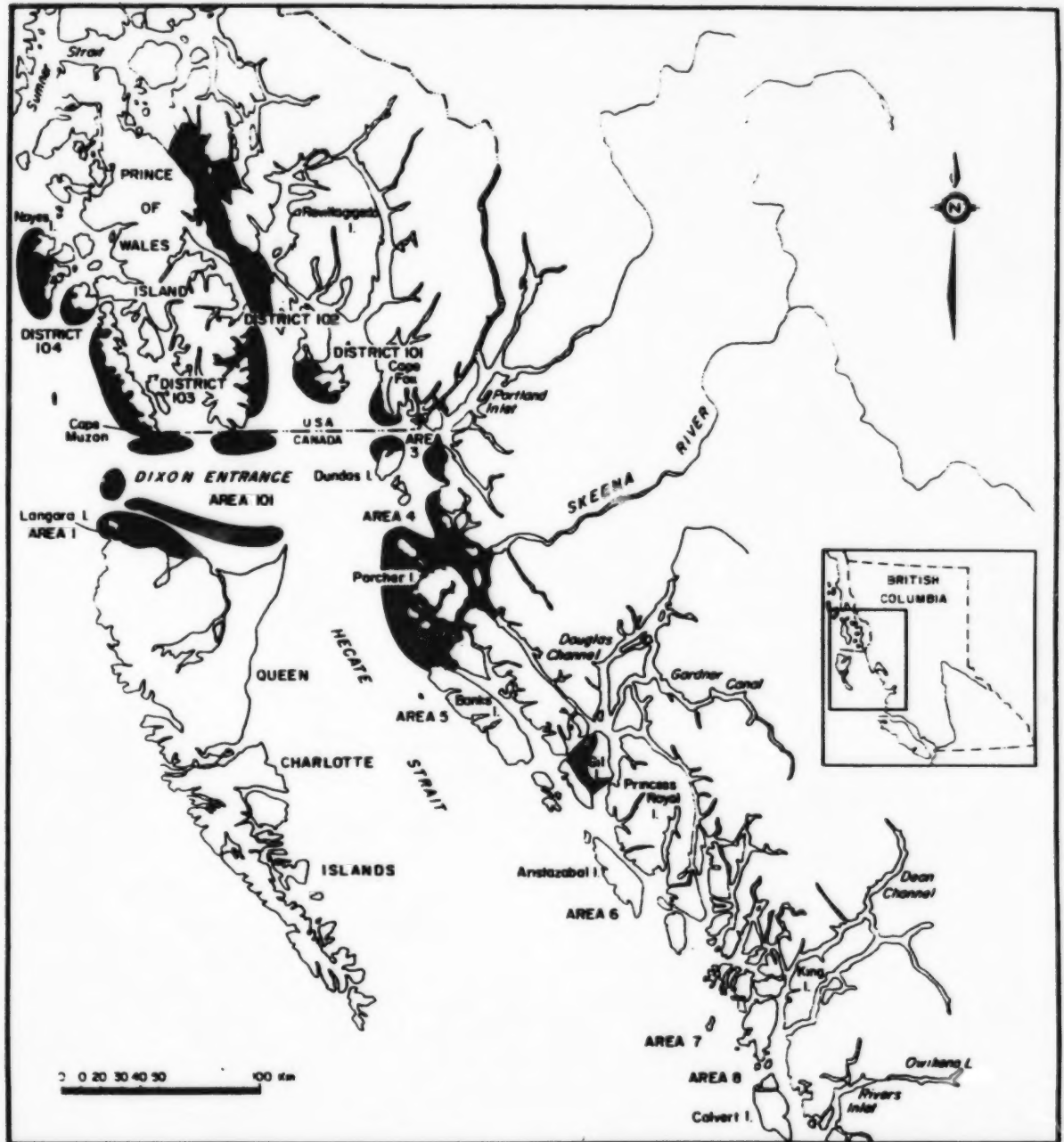


Fig. 1. The study location. Shaded areas indicate where tagging vessels operated from 1982 to 1985. Troll vessels were restricted to the open water areas of Dixon Entrance (statistical area 101). Seiners were used in all other marked areas. Only those marked areas within Canadian territorial waters are considered in this report.



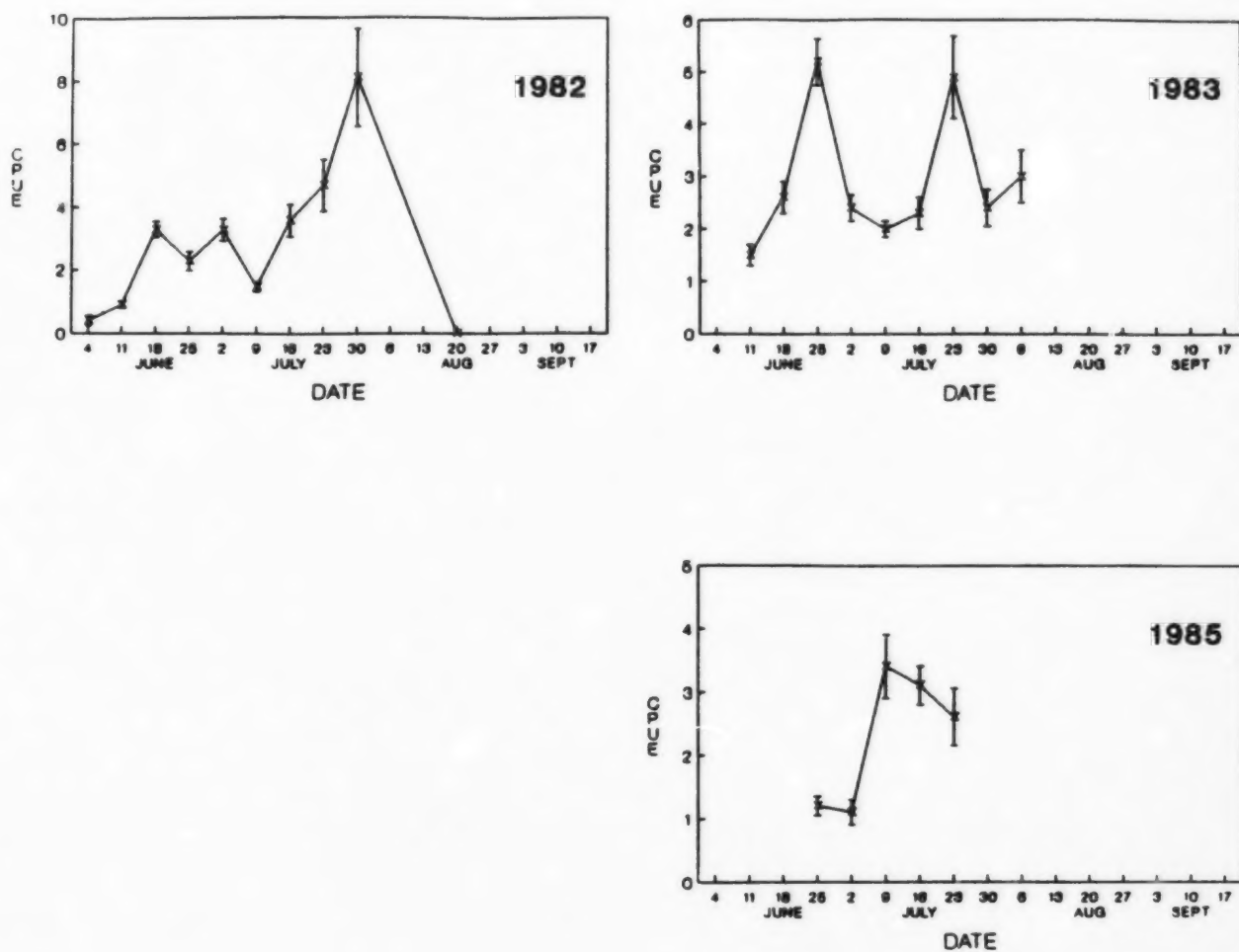
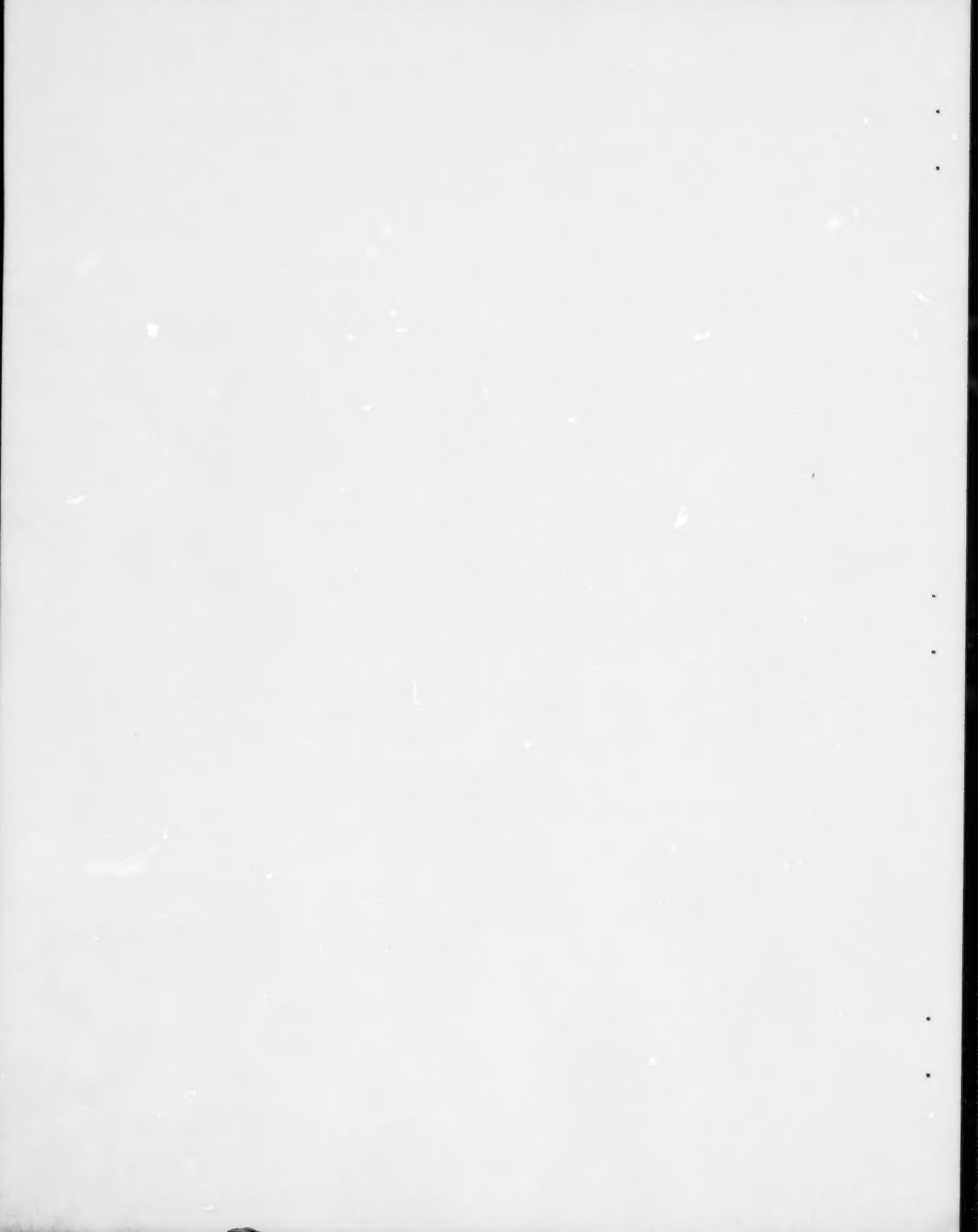


Fig. 2. Seasonal changes in the catch-per-unit-of-effort (catch per set) of chinook salmon for the tagging seine vessels in Statistical Area 1 in 1982, 1983, and 1985. (vertical bars indicate one standard error).



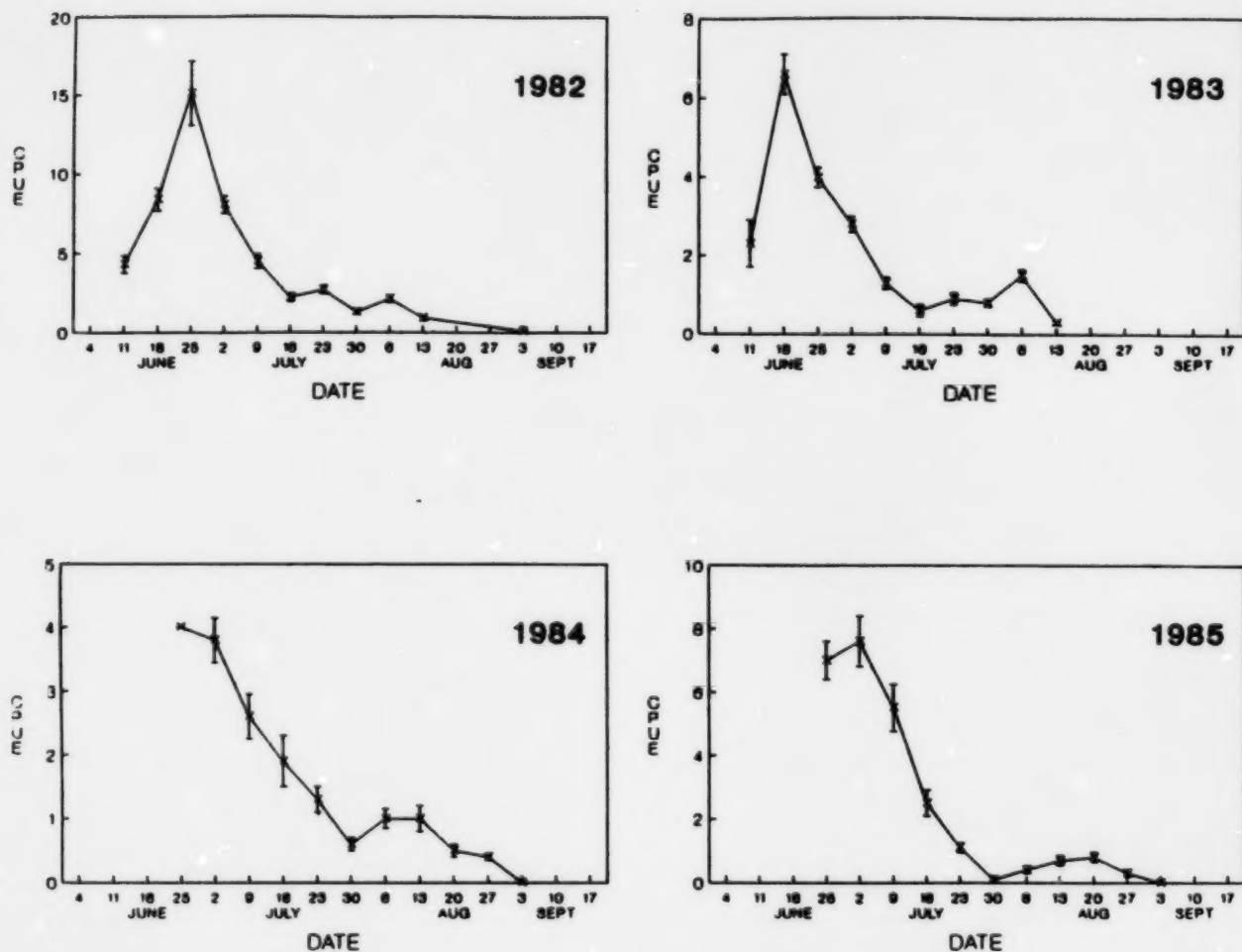


Fig. 3. Seasonal changes in the catch-per-unit-of-effort (catch per set) of chinook salmon for the tagging seine vessels in Statistical Area 3 in 1982, 1983, 1984, and 1985. (vertical bars indicate one standard error).



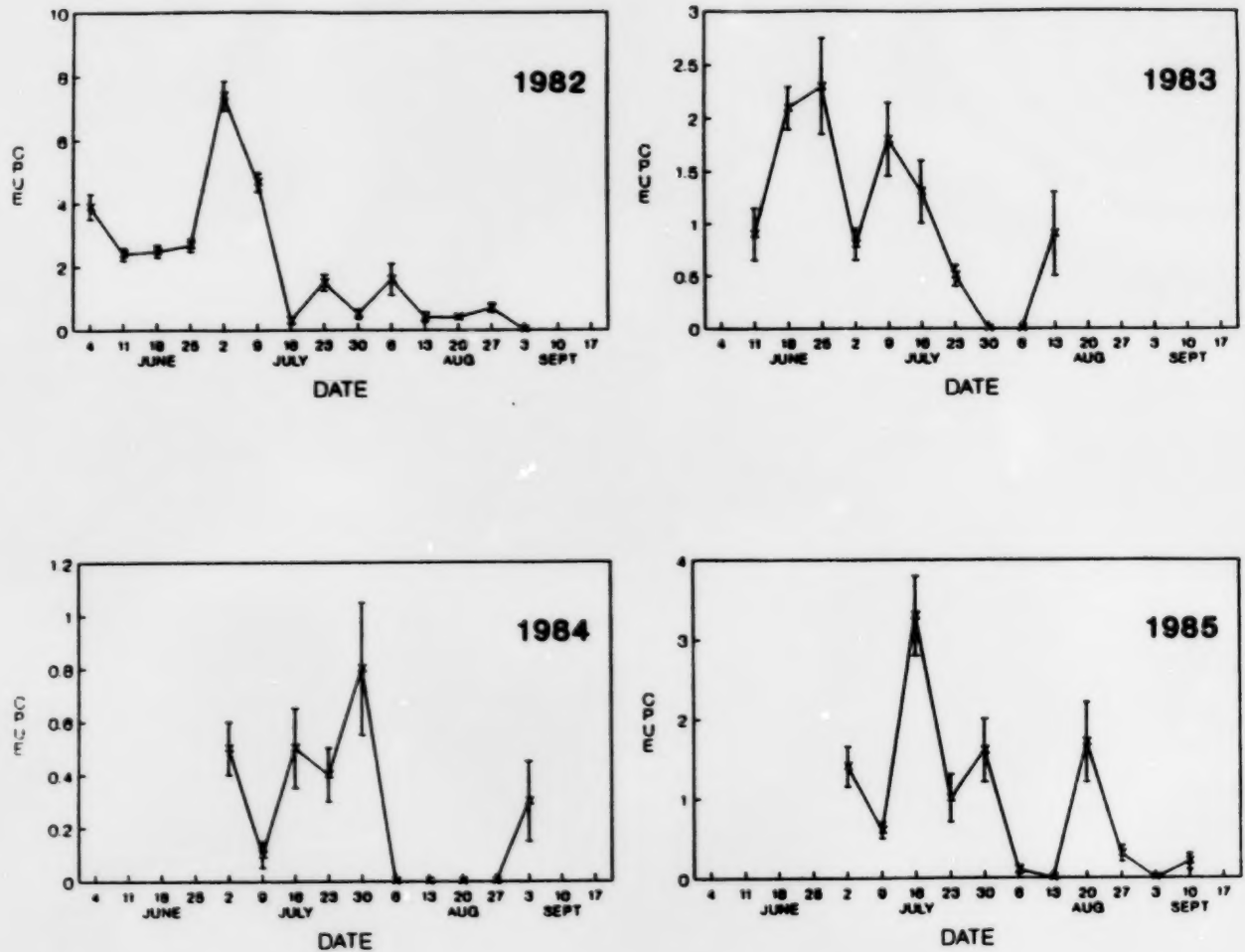


Fig. 4. Seasonal changes in the catch-per-unit-of-effort (catch per set) of chinook salmon for the tagging seine vessels in Statistical Area 4 in 1982, 1983, 1984, and 1985. (vertical bars indicate one standard error).



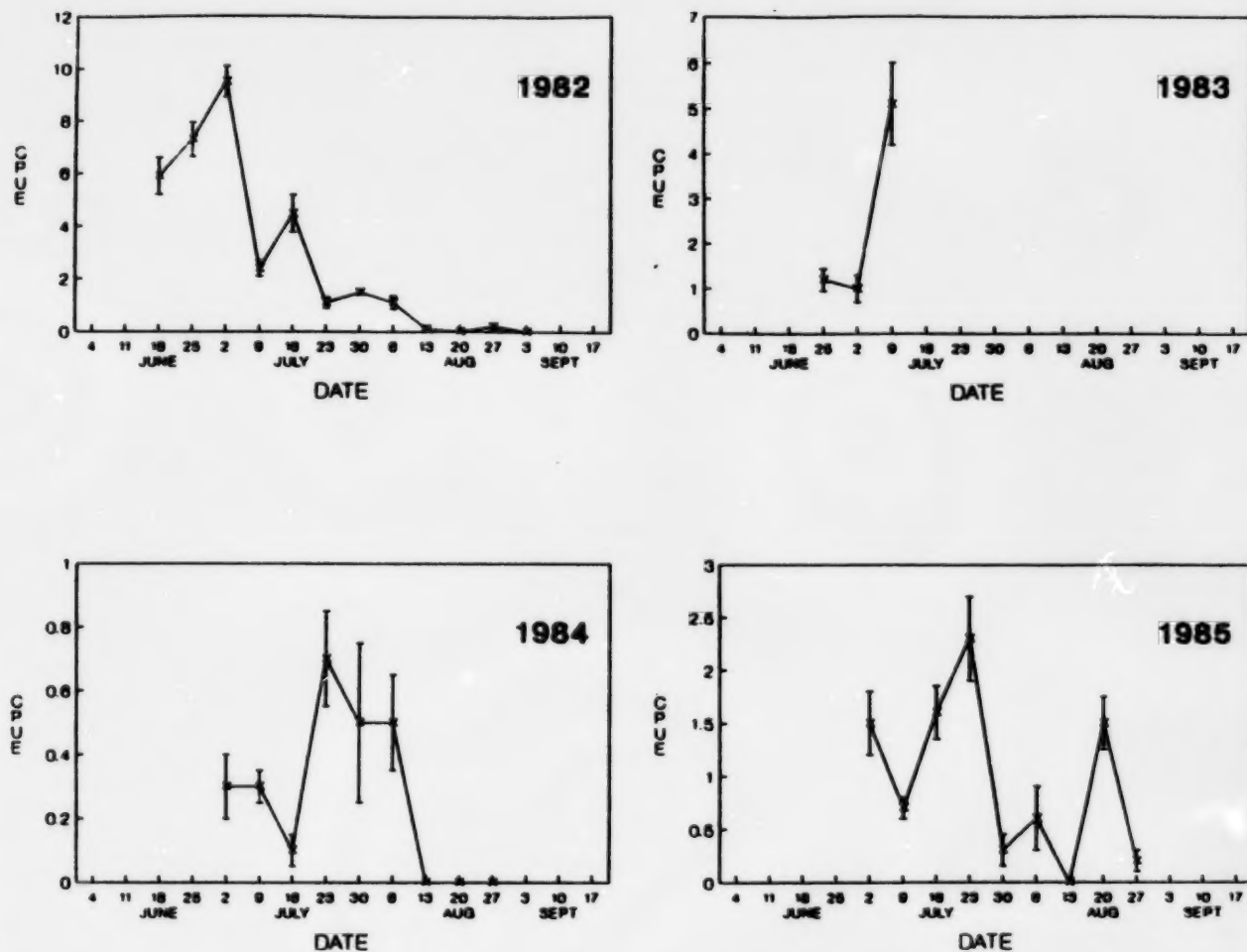
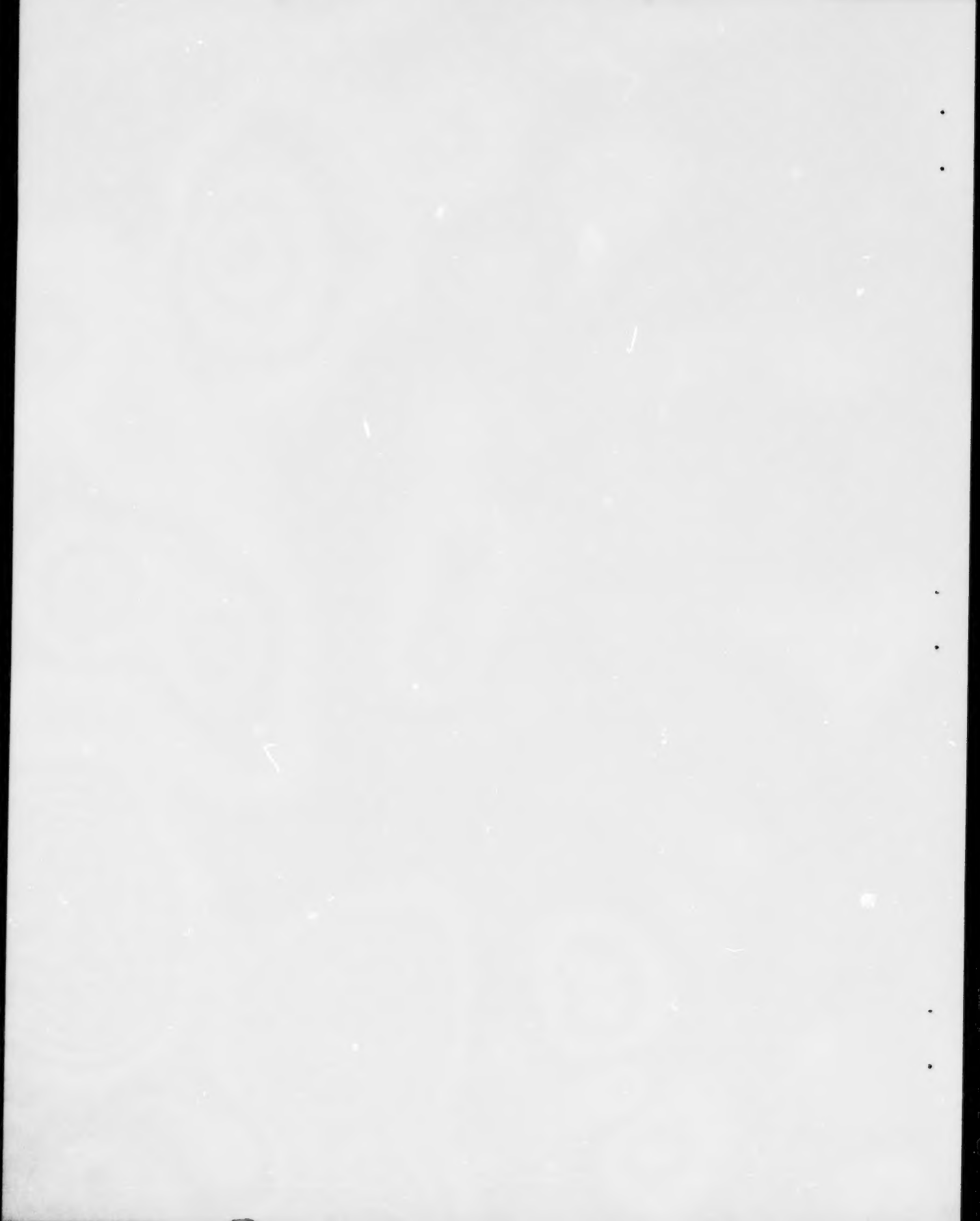


Fig. 5. Seasonal changes in the catch-per-unit-of-effort (catch per set) of chinook salmon for the tagging seine vessels in Statistical Area 5 in 1982, 1983, 1984, and 1985. (vertical bars indicate one standard error).



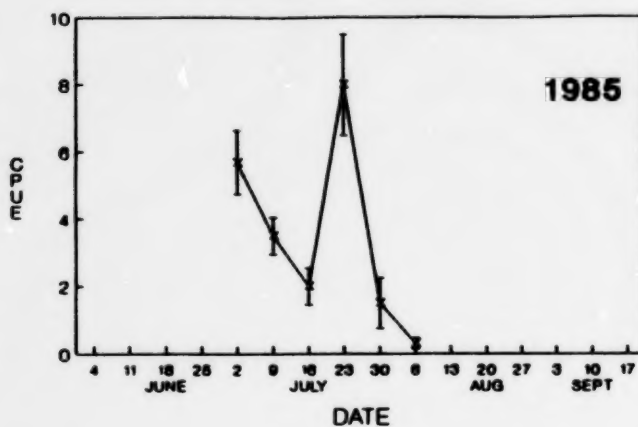


Fig. 6. Seasonal changes in the catch-per-unit-of-effort (catch per set) of chinook salmon for the tagging seine vessels in Statistical Area 6 in 1985. (vertical bars indicate one standard error).



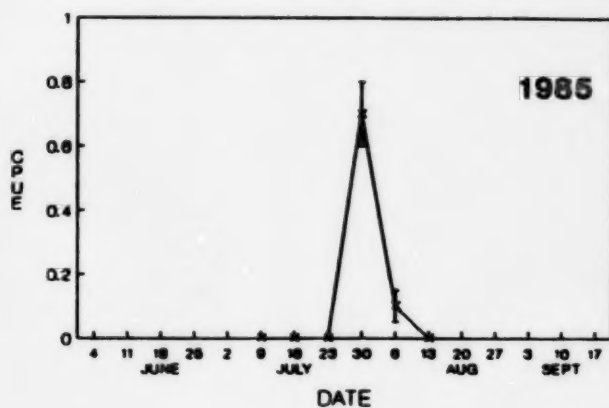
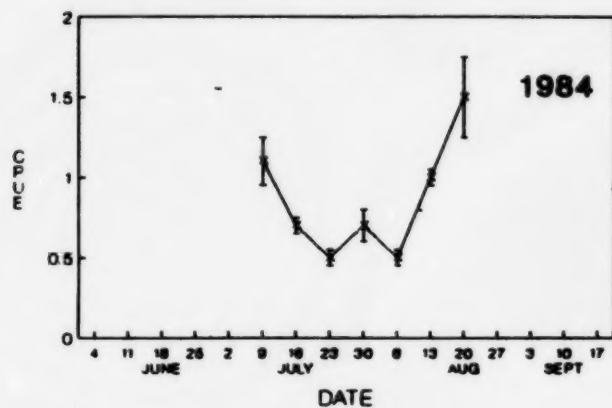
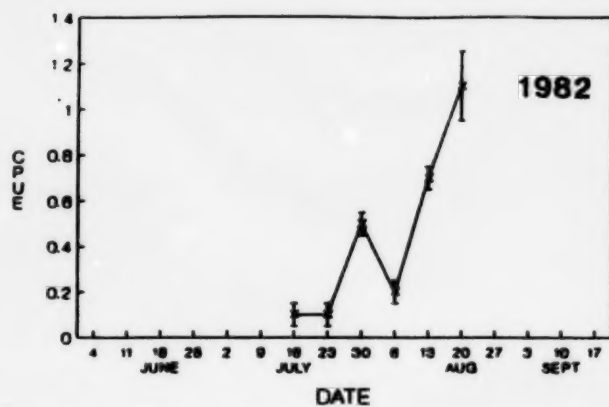


Fig. 7. Seasonal changes in the catch-per-unit-of-effort (catch per tack) of chinook salmon for the tagging troll vessels in Statistical Area 1 in 1982, 1984, and 1985. (vertical bars indicate one standard error).



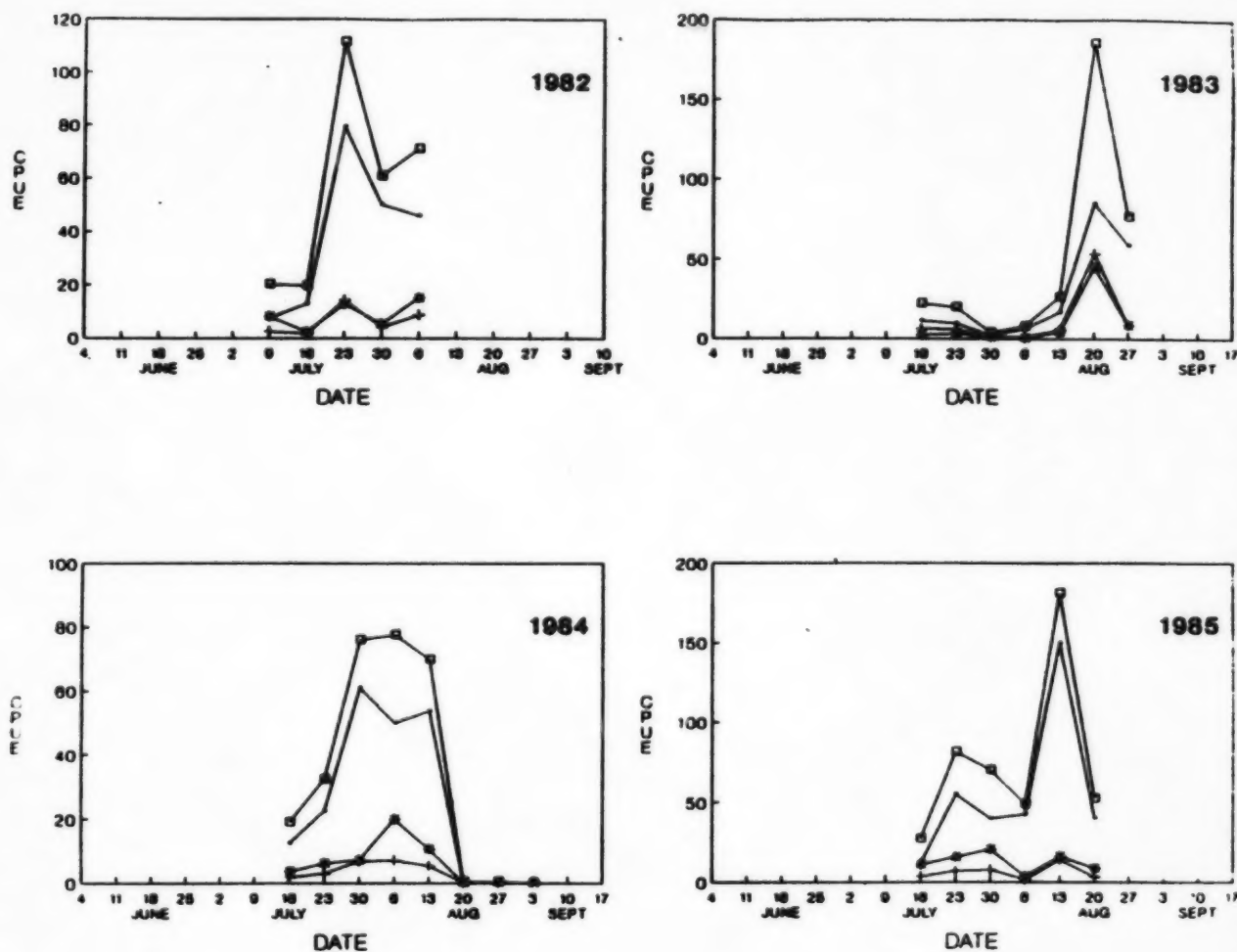


Fig. 8. Seasonal changes in the catch-per-unit-of-effort (catch per boat day) of chinook salmon for commercial seine vessels in Statistical Area 1 in 1982, 1983, 1984, and 1985. CPUE is shown for small (x), medium (+), large (•), and total chinook (■).



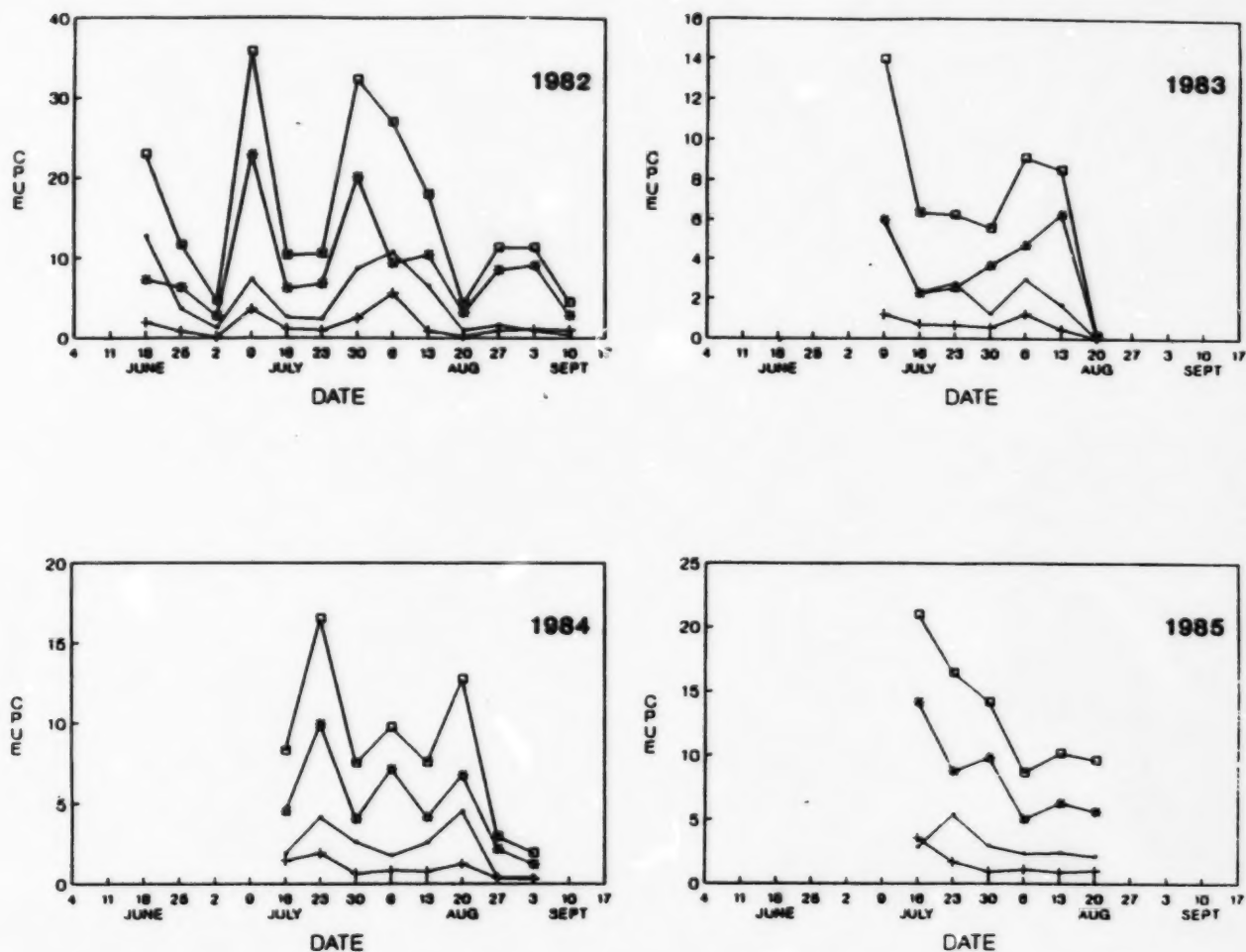


Fig. 9. Seasonal changes in the catch-per-unit-of-effort (catch per boat day) of chinook salmon for commercial seine vessels in Statistical Area 3 in 1982, 1983, 1984, and 1985. CPUE is shown for small (\*), medium (+), large (→), and total chinook (■).



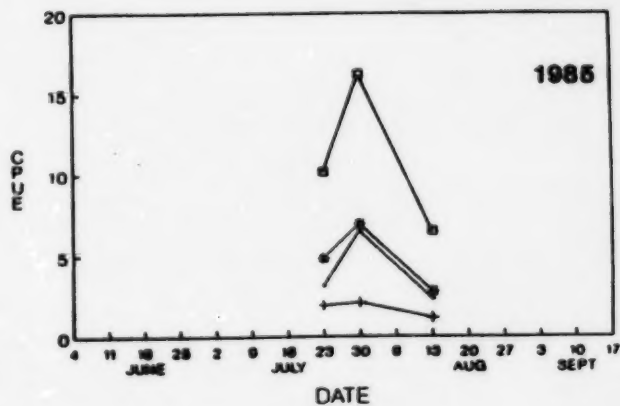
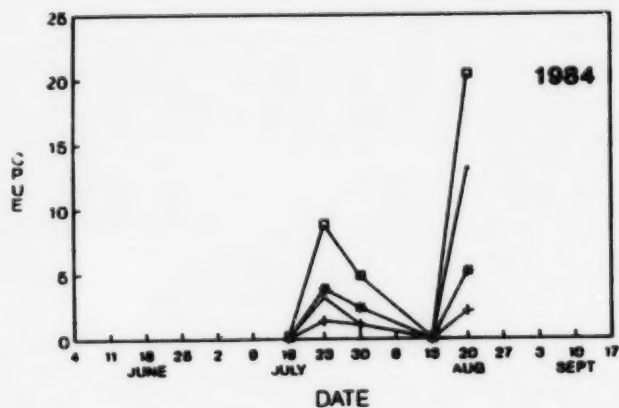
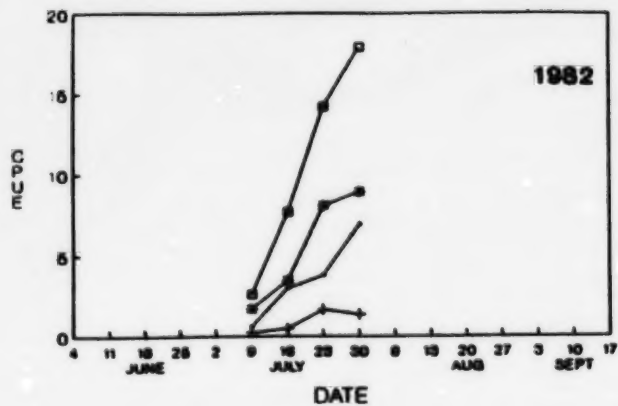


Fig. 10. Seasonal changes in the catch-per-unit-of-effort (catch per boat day) of chinook salmon for commercial seine vessels in Statistical Area 4 in 1982, 1984, and 1985. CPUE is shown for small (x), medium (+), large (—), and total chinook (■).



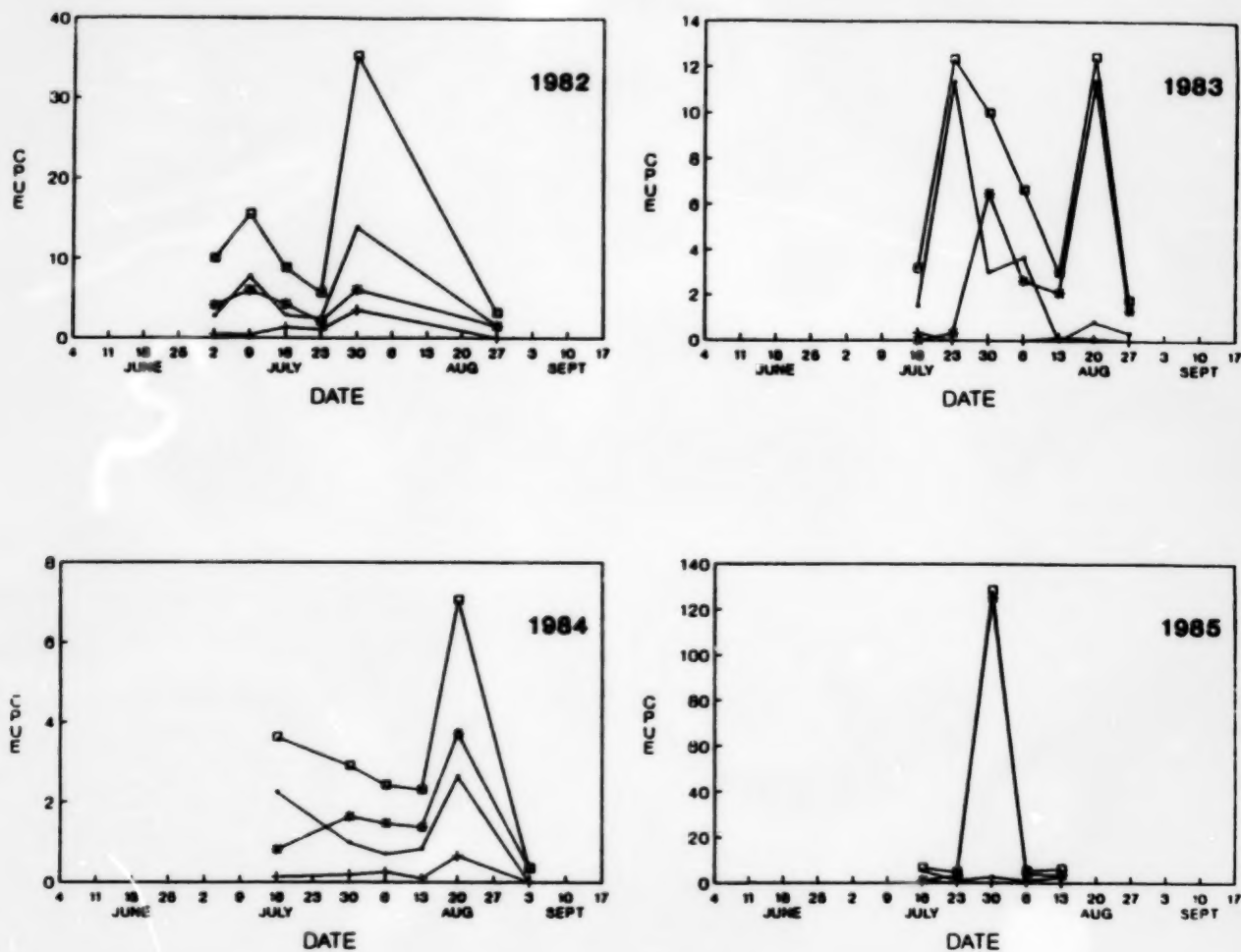


Fig. 11. Seasonal changes in the catch-per-unit-of-effort (catch per boat day) of chinook salmon for commercial seine vessels in Statistical Area 5 in 1982, 1983, 1984, and 1985. CPUE is shown for small (\*), medium (+), large (<), and total chinook (□).



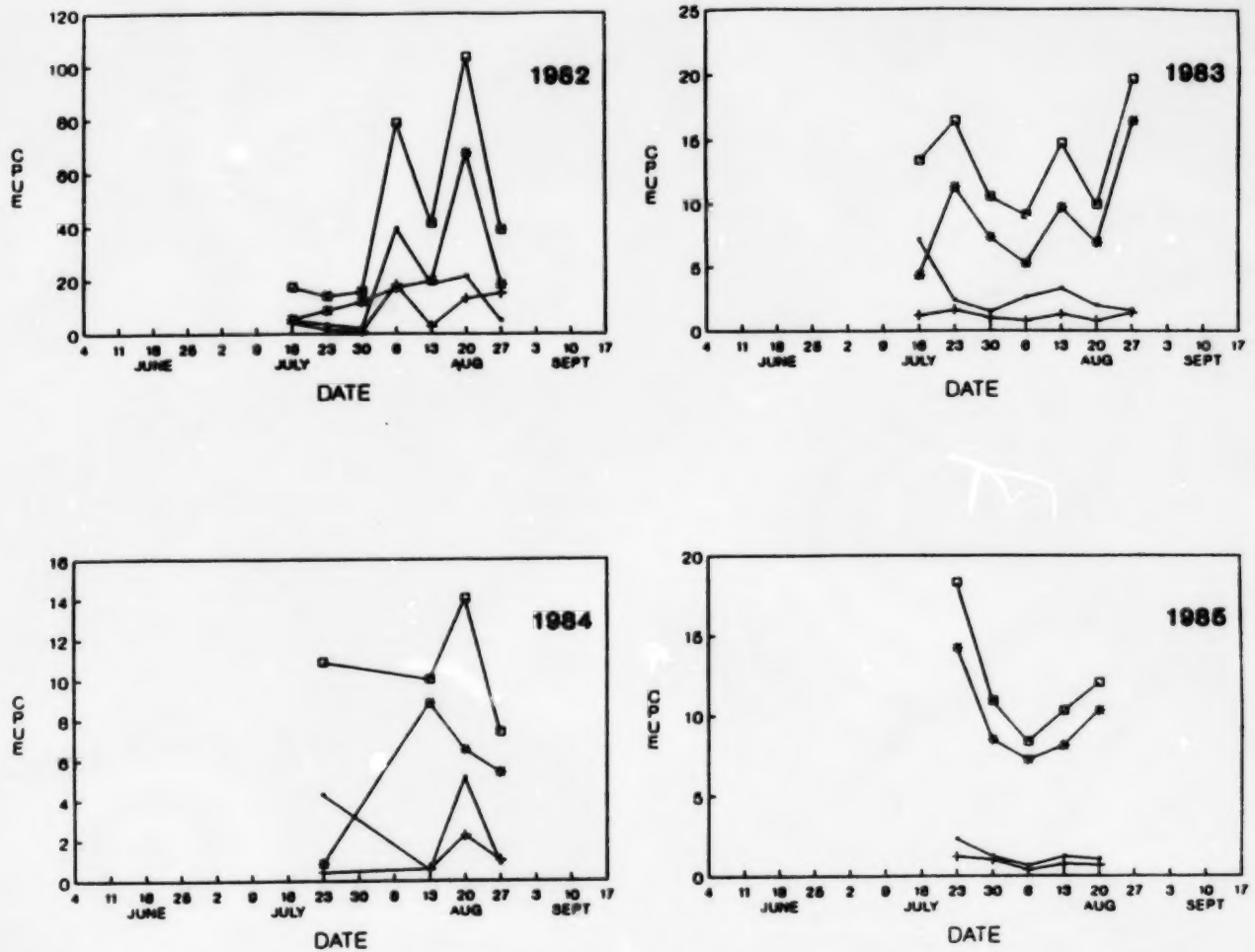


Fig. 12. Seasonal changes in the catch-per-unit-of-effort (catch per boat day) of chinook salmon for commercial seine vessels in Statistical Area 6 in 1982, 1983, 1984, and 1985. CPUE is shown for small (\*), medium (+), large (o), and total chinook (□).



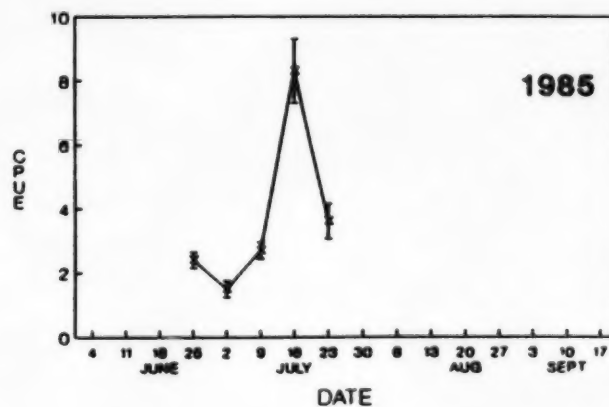
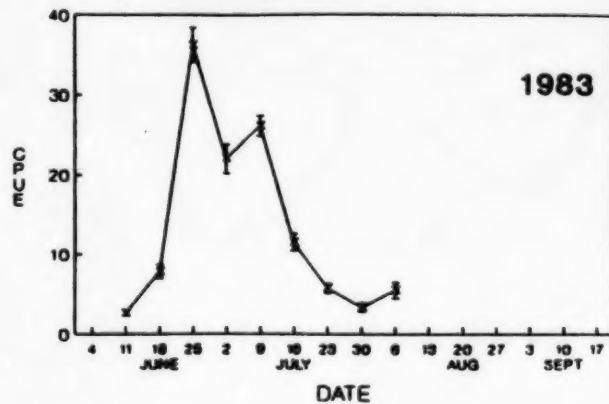
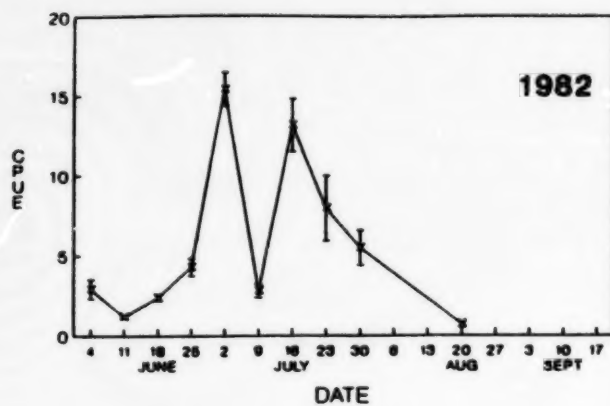


Fig. 13. Seasonal changes in the catch-per-unit-of-effort (catch per set) of coho salmon for the tagging seine vessels in Statistical Area 1 in 1982, 1983, and 1985. (vertical bars indicate one standard error).



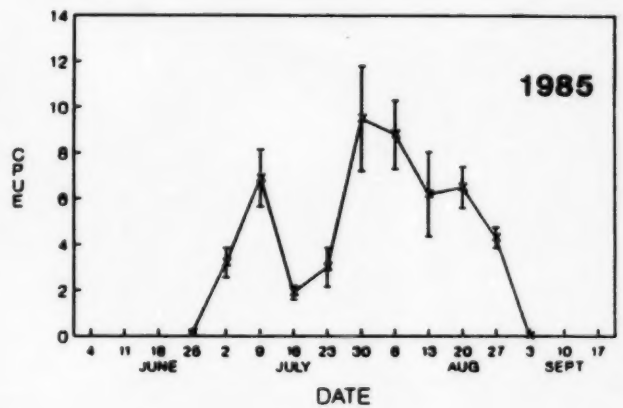
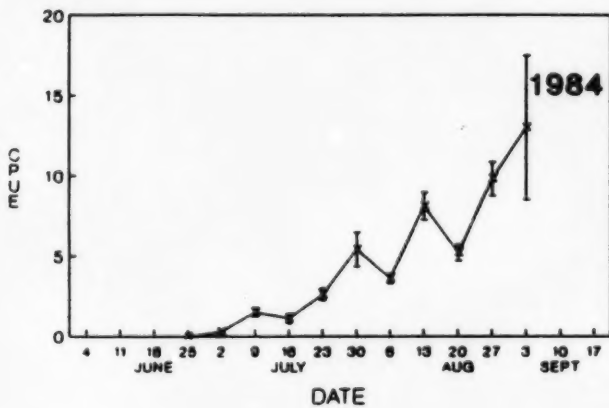
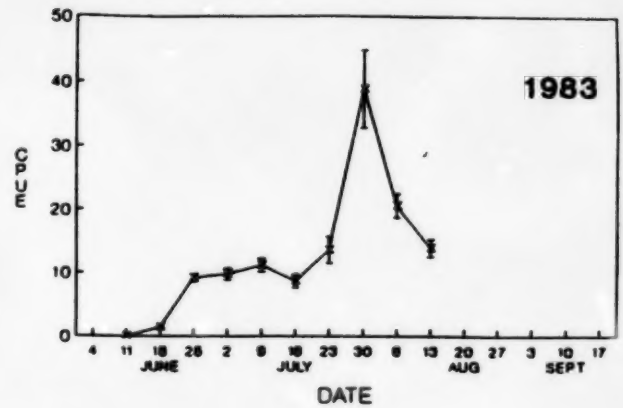
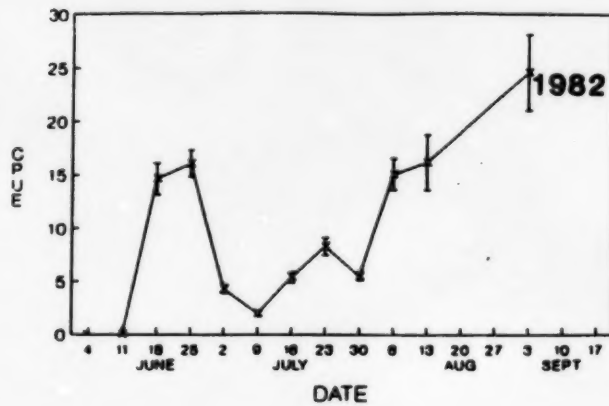


Fig. 14. Seasonal changes in the catch-per-unit-of-effort (catch per set) of coho salmon for the tagging seine vessels in Statistical Area 3 in 1982, 1983, 1984, and 1985. (vertical bars indicate one standard error).



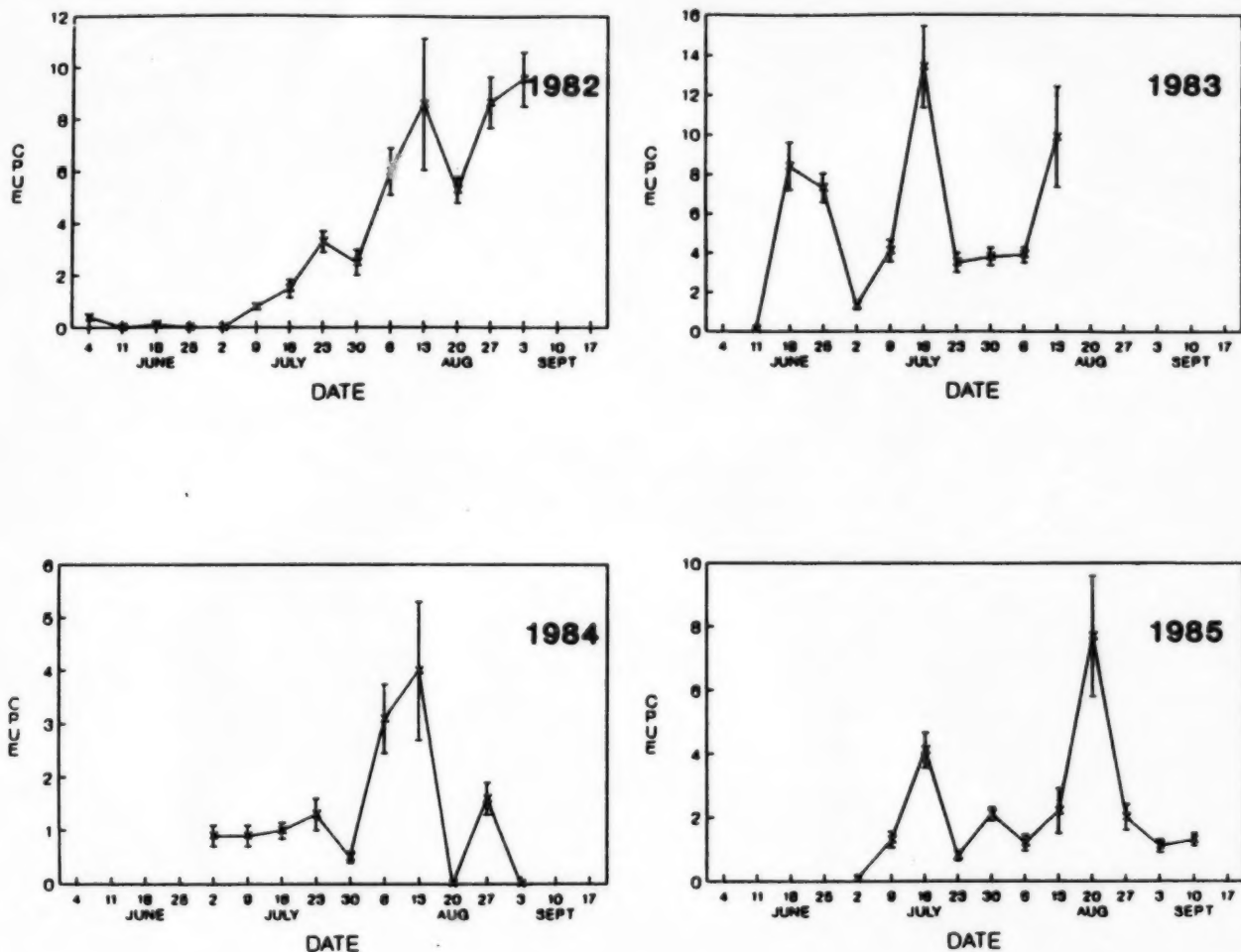


Fig. 15. Seasonal changes in the catch-per-unit-of-effort (catch per set) of coho salmon for the tagging seine vessels in Statistical Area 4 in 1982, 1983, 1984, and 1985. (vertical bars indicate one standard error).



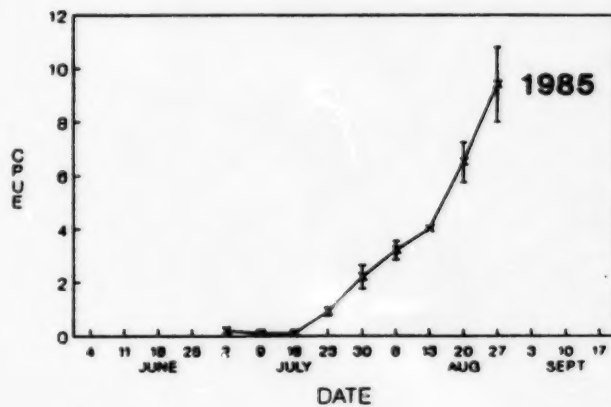
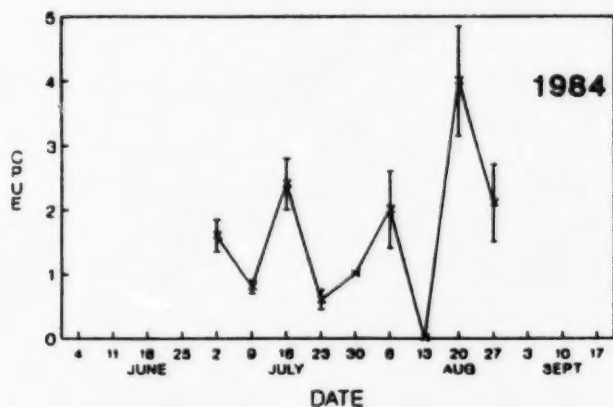
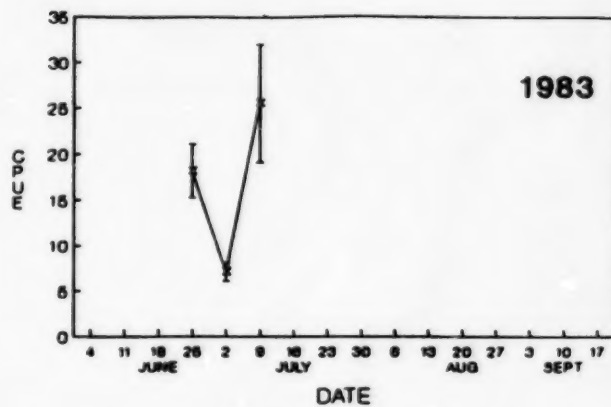
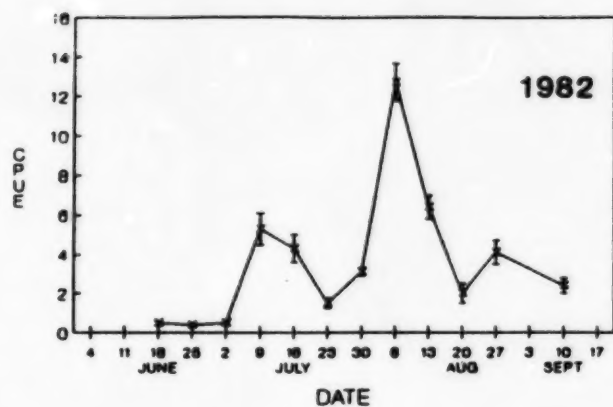


Fig. 16. Seasonal changes in the catch-per-unit-of-effort (catch per set) of coho salmon for the tagging seine vessels in Statistical Area 5 in 1982, 1983, 1984, and 1985. (vertical bars indicate one standard error).



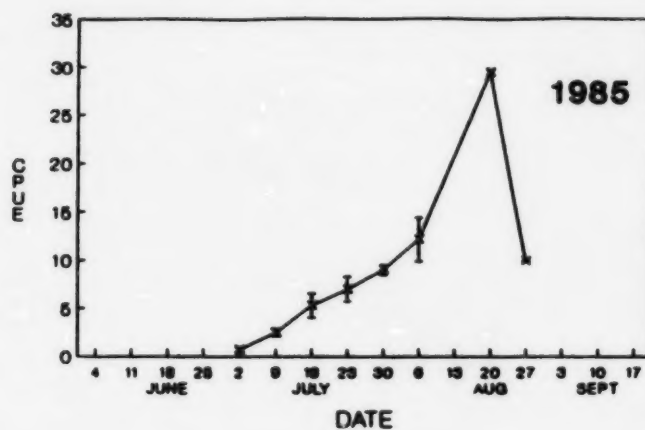


Fig. 17. Seasonal changes in the catch-per-unit-of-effort (catch per set) of coho salmon for the tagging seine vessels in Statistical Area 6 in 1985. (vertical bars indicate one standard error).



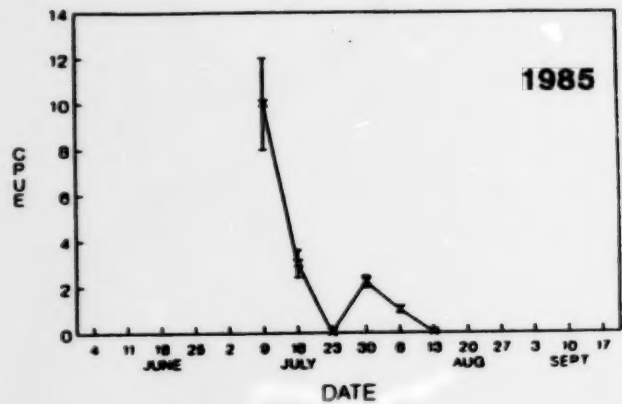
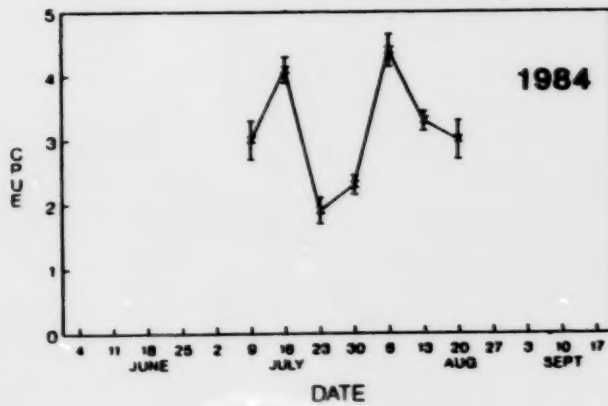
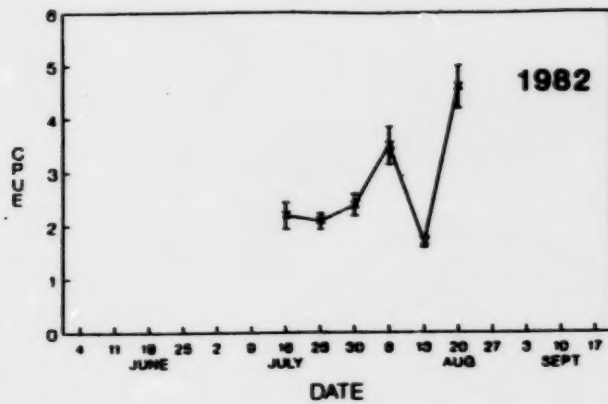


Fig. 18. Seasonal changes in the catch-per-unit-of-effort (catch per tack) of coho salmon for the tagging troll vessels in Statistical Area 1 in 1982, 1984, and 1985. (vertical bars indicate one standard error).



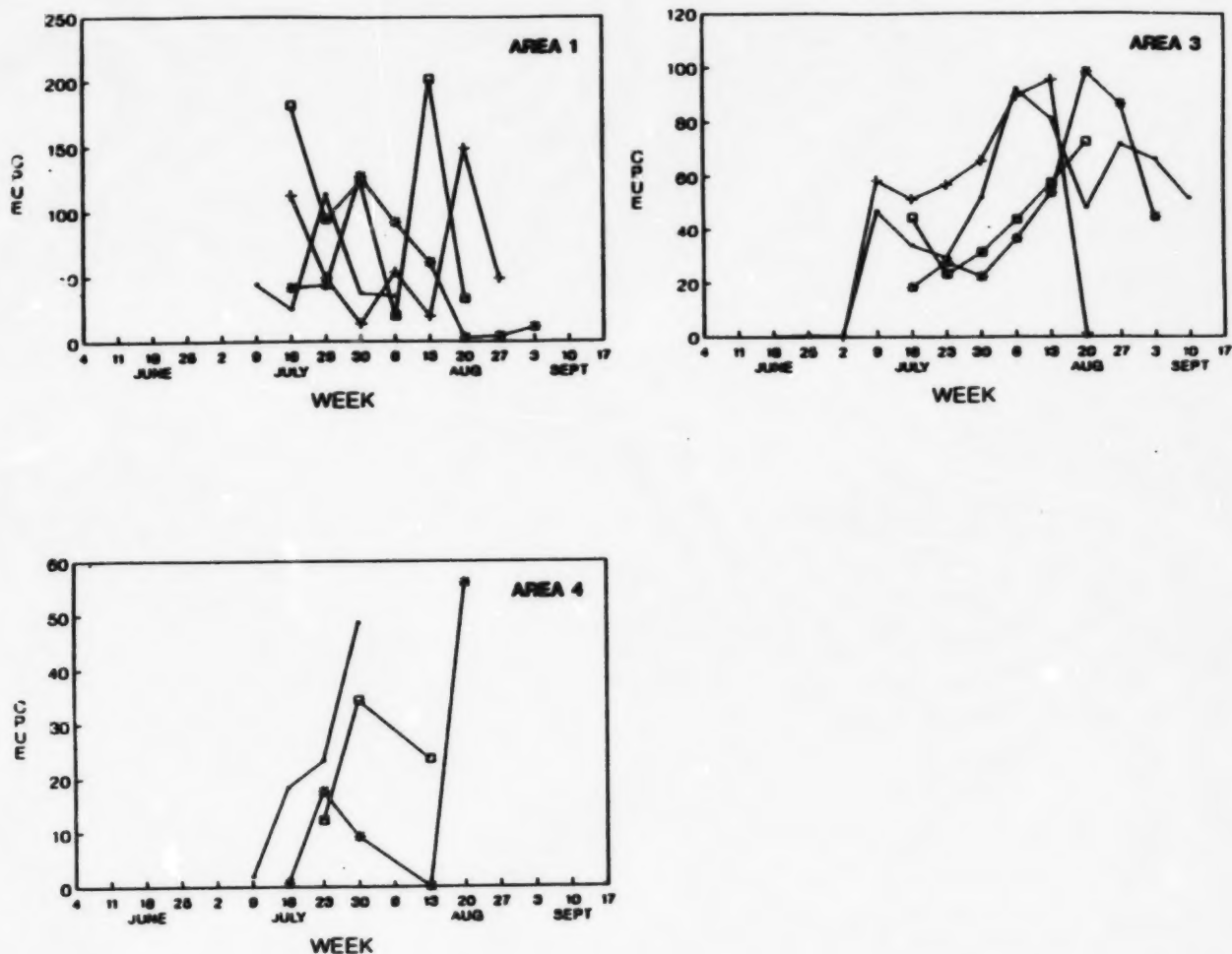


Fig. 19. Seasonal changes in the catch-per-unit-of-effort (catch per boat day) of coho salmon for commercial seine vessels in Statistical Areas 1,3, and 4 in 1982 (—●—), 1983 (—+—), 1984 (—\*—), and 1985 (—□—).



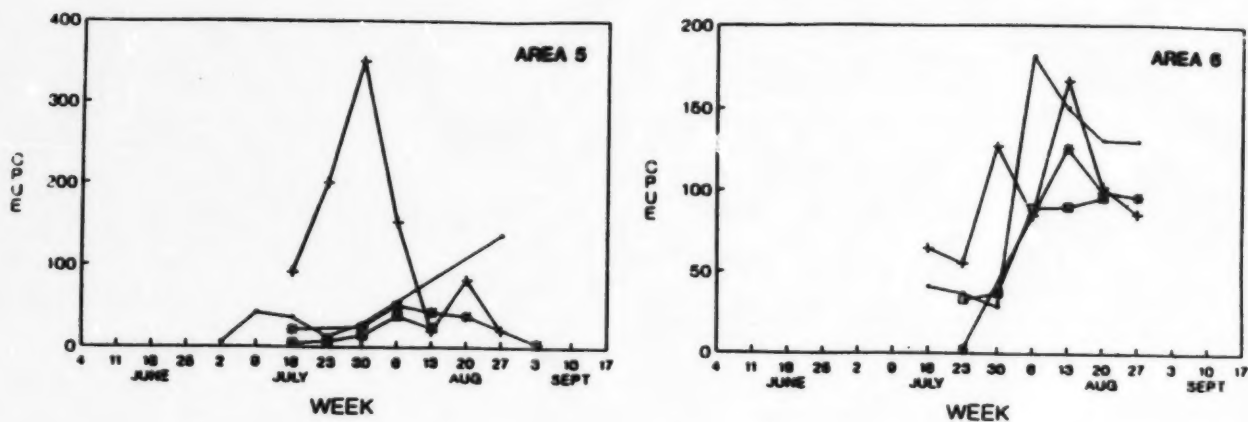


Fig. 20. Seasonal changes in the catch-per-unit-of-effort (catch per boat day) of coho salmon for commercial seine vessels in Statistical Areas 5 and 6 in 1982 (—●—), 1983 (—+—), 1984 (—\*—), and 1985 (—■—).



Appendix 1. Catch of sockeye, pink and chum salmon and steelhead trout by the seine tagging vessels by week for statistical areas 1, 3, 4 and 5 from 1982 to 1985. CPUE, SE and N refer to catch-per-unit-of-effort, standard error of the CPUE and the number of sets respectively.

| SOCKEYE CATCH BY SEINE |              |       |      |      |       |      |     |      |      |     |       |      |     |  |  |
|------------------------|--------------|-------|------|------|-------|------|-----|------|------|-----|-------|------|-----|--|--|
| 1982                   |              |       |      | 1983 |       |      |     | 1984 |      |     |       | 1985 |     |  |  |
| AREA 1                 | WEEK         | CPUE  | SE   | N    | CPUE  | SE   | N   | CPUE | SE   | N   | CPUE  | SE   | N   |  |  |
|                        | JUN 01-07    | 0.4   | 0.4  | 7    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 08-14    | 3     | 0.5  | 61   | 7.2   | 3.2  | 18  | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 15-21    | 12.4  | 2.5  | 58   | 5.2   | 0.9  | 29  | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 22-28    | 40.9  | 7.8  | 48   | 6.4   | 1.3  | 35  | 0    | 0    | 0   | 12.3  | 3.6  | 19  |  |  |
|                        | JUN 29-JUL 5 | 82    | 11.4 | 38   | 11.1  | 1.6  | 45  | 0    | 0    | 0   | 9.3   | 3.3  | 11  |  |  |
|                        | JUL 06-12    | 30.9  | 8.6  | 19   | 35    | 5.4  | 34  | 0    | 0    | 0   | 43.9  | 16.6 | 19  |  |  |
|                        | JUL 13-19    | 50.5  | 10.6 | 30   | 34.6  | 8    | 26  | 0    | 0    | 0   | 38    | 11.2 | 16  |  |  |
|                        | JUL 20-26    | 40.9  | 10   | 17   | 34.5  | 9.5  | 13  | 0    | 0    | 0   | 126.3 | 47.5 | 3   |  |  |
|                        | JUL 27-AUG 2 | 29.2  | 12.5 | 13   | 30.9  | 4    | 20  | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | AUG 03-09    | 0     | 0    | 0    | 108.1 | 45   | 18  | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | AUG 10-16    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | AUG 17-23    | 4.5   | 2.2  | 6    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | AUG 24-30    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | AUG 31-SEP 6 | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | SEP 07-13    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | SEP 14-20    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | MEAN         | 30.9  | 7.5  | 297  | 22.8  | 10.6 | 230 | 0    | 0    | 0   | 38.2  | 16.7 | 73  |  |  |
| AREA 3                 | WEEK         | CPUE  | SE   | N    | CPUE  | SE   | N   | CPUE | SE   | N   | CPUE  | SE   | N   |  |  |
|                        | JUN 01-07    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 08-14    | 17.5  | 3.9  | 14   | 0.7   | 0.3  | 3   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 15-21    | 7.1   | 1.8  | 32   | 8.7   | 1.2  | 65  | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 22-28    | 15.3  | 3.5  | 43   | 16.7  | 2.2  | 85  | 4    | 0    | 1   | 9.1   | 4.5  | 27  |  |  |
|                        | JUN 29-JUL 5 | 28.5  | 4.9  | 63   | 15.2  | 2.9  | 49  | 13.6 | 5    | 21  | 16.6  | 6.5  | 21  |  |  |
|                        | JUL 06-12    | 32.7  | 10.3 | 44   | 16.6  | 2.9  | 39  | 16   | 3.9  | 28  | 57.5  | 22.2 | 16  |  |  |
|                        | JUL 13-19    | 106.5 | 30.7 | 27   | 50.7  | 18.1 | 26  | 19.7 | 12   | 10  | 24.5  | 7.1  | 26  |  |  |
|                        | JUL 20-26    | 21.2  | 5.8  | 41   | 24.5  | 6.7  | 15  | 33   | 9.4  | 13  | 42.9  | 10.8 | 11  |  |  |
|                        | JUL 27-AUG 2 | 32.5  | 8.5  | 63   | 115.1 | 38.6 | 21  | 17.6 | 4.8  | 18  | 30.5  | 12.1 | 10  |  |  |
|                        | AUG 03-09    | 29.9  | 9.1  | 25   | 46.5  | 10.1 | 21  | 12.7 | 3.2  | 25  | 55.1  | 24.2 | 18  |  |  |
|                        | AUG 10-16    | 15.6  | 6.9  | 15   | 15.5  | 2.7  | 19  | 16.5 | 5.3  | 29  | 40.1  | 22.5 | 9   |  |  |
|                        | AUG 17-23    | 0     | 0    | 0    | 0     | 0    | 0   | 9    | 3.2  | 22  | 26.3  | 6.4  | 23  |  |  |
|                        | AUG 24-30    | 0     | 0    | 0    | 0     | 0    | 0   | 2.7  | 0.5  | 36  | 3.5   | 0.8  | 19  |  |  |
|                        | AUG 31-SEP 6 | 1.9   | 3.7  | 18   | 0     | 0    | 0   | 1    | 1    | 2   | 3     | 0    | 1   |  |  |
|                        | SEP 07-13    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | SEP 14-20    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | MEAN         | 31.1  | 9.9  | 405  | 25.5  | 11.3 | 343 | 13.5 | 4.8  | 206 | 27.4  | 12.8 | 183 |  |  |
| AREA 4                 | WEEK         | CPUE  | SE   | N    | CPUE  | SE   | N   | CPUE | SE   | N   | CPUE  | SE   | N   |  |  |
|                        | JUN 01-07    | 37.9  | 15.8 | 21   | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 08-14    | 25.9  | 6.5  | 44   | 0.6   | 0.3  | 10  | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 15-21    | 9.2   | 1.6  | 51   | 7.2   | 2.3  | 31  | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 22-28    | 10.8  | 1.7  | 48   | 4.9   | 1.1  | 30  | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 29-JUL 5 | 28.9  | 4.8  | 30   | 3.7   | 1    | 29  | 1.4  | 0.5  | 23  | 4.9   | 2    | 14  |  |  |
|                        | JUL 06-12    | 36.2  | 10.2 | 26   | 4.8   | 1.9  | 17  | 4.6  | 1.3  | 19  | 2.7   | 0.6  | 14  |  |  |
|                        | JUL 13-19    | 39.9  | 10.8 | 15   | 17.9  | 5.1  | 25  | 11.5 | 3.2  | 6   | 121.1 | 48.1 | 8   |  |  |
|                        | JUL 20-26    | 30.6  | 22.6 | 11   | 13.2  | 2.9  | 33  | 44.9 | 19   | 10  | 51.6  | 18   | 10  |  |  |
|                        | JUL 27-AUG 2 | 16.5  | 4.7  | 8    | 47.1  | 11.9 | 16  | 8    | 6.8  | 6   | 103.4 | 29.7 | 16  |  |  |
|                        | AUG 03-09    | 9.8   | 3.6  | 15   | 37.8  | 8.5  | 20  | 35.7 | 21.2 | 9   | 137.8 | 96.3 | 9   |  |  |
|                        | AUG 10-16    | 0     | 0    | 7    | 14    | 3.5  | 15  | 5.3  | 2.2  | 10  | 38    | 12.3 | 5   |  |  |
|                        | AUG 17-23    | 4.7   | 1.7  | 17   | 0     | 0    | 0   | 1    | 0    | 2   | 18.3  | 8.5  | 7   |  |  |
|                        | AUG 24-30    | 1     | 0.5  | 10   | 0     | 0    | 0   | 1.9  | 1.1  | 8   | 12    | 4    | 15  |  |  |
|                        | AUG 31-SEP 6 | 0.9   | 0.3  | 17   | 0     | 0    | 0   | 0    | 0    | 3   | 1.4   | 0.7  | 9   |  |  |
|                        | SEP 07-13    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 1.4   | 0.7  | 9   |  |  |
|                        | SEP 14-20    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | MEAN         | 18.9  | 7.6  | 320  | 14    | 4.8  | 226 | 11.2 | 9.2  | 96  | 43.5  | 32.4 | 115 |  |  |
| AREA 5                 | WEEK         | CPUE  | SE   | N    | CPUE  | SE   | N   | CPUE | SE   | N   | CPUE  | SE   | N   |  |  |
|                        | JUN 01-07    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 08-14    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 15-21    | 36.1  | 11.2 | 27   | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 22-28    | 24    | 5.8  | 25   | 6     | 1.9  | 6   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | JUN 29-JUL 5 | 21.1  | 3.5  | 19   | 8.9   | 1.7  | 10  | 5.6  | 1.2  | 7   | 7     | 5.1  | 6   |  |  |
|                        | JUL 06-12    | 16.4  | 4.3  | 26   | 33.1  | 11.4 | 7   | 6.8  | 1.7  | 36  | 19    | 5.2  | 11  |  |  |
|                        | JUL 13-19    | 99.9  | 41.4 | 14   | 0     | 0    | 0   | 3.3  | 1.2  | 7   | 17    | 5.8  | 7   |  |  |
|                        | JUL 20-26    | 75.8  | 40.6 | 19   | 0     | 0    | 0   | 15.1 | 10.2 | 7   | 21.1  | 5.9  | 9   |  |  |
|                        | JUL 27-AUG 2 | 34    | 4.9  | 56   | 0     | 0    | 0   | 23.5 | 22.5 | 2   | 19    | 3    | 6   |  |  |
|                        | AUG 03-09    | 19    | 4    | 40   | 0     | 0    | 0   | 3.3  | 2    | 4   | 11.2  | 5.2  | 5   |  |  |
|                        | AUG 10-16    | 3.3   | 3.8  | 15   | 0     | 0    | 0   | 0    | 0    | 0   | 19    | 3    | 3   |  |  |
|                        | AUG 17-23    | 1.7   | 0.9  | 3    | 0     | 0    | 0   | 2.4  | 0.6  | 5   | 11    | 2.4  | 3   |  |  |
|                        | AUG 24-30    | 0.2   | 0.2  | 11   | 0     | 0    | 0   | 0.4  | 0.4  | 7   | 7.4   | 2.4  | 3   |  |  |
|                        | AUG 31-SEP 6 | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | SEP 07-13    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | SEP 14-20    | 0     | 0    | 0    | 0     | 0    | 0   | 0    | 0    | 0   | 0     | 0    | 0   |  |  |
|                        | MEAN         | 30.2  | 15.4 | 263  | 15.2  | 5.5  | 25  | 6.2  | 4.9  | 78  | 15.5  | 5.2  | 52  |  |  |

Appendix 1. (continued).

| PINK CATCH BY SEINE |       |      |     |       |       |     |       |       |     |       |       |     |
|---------------------|-------|------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|
|                     |       |      |     | 1983  |       |     | 1984  |       |     | 1985  |       |     |
| AREA 1              |       |      |     |       |       |     |       |       |     |       |       |     |
| WEEK                | CPUE  | SE   | N   | CPUE  | SE    | N   | CPUE  | SE    | N   | CPUE  | SE    | N   |
| JUN 01-07           | 2.1   | 3.4  | 7   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 08-14           | 2     | 0.3  | 51  | 7.6   | 2.5   | 18  | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 15-21           | 9.4   | 1.6  | 58  | 33.4  | 14.4  | 29  | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 22-28           | 24.9  | 5.9  | 48  | 28.3  | 5.1   | 33  | 0     | 0     | 0   | 15.5  | 4.5   | 19  |
| JUN 29-JUL5         | 14.1  | 3.9  | 38  | 6.3   | 1.4   | 45  | 0     | 0     | 0   | 39    | 27.2  | 11  |
| JUL 06-12           | 0.8   | 0.4  | 19  | 45.1  | 11    | 34  | 0     | 0     | 0   | 21.1  | 5.2   | 19  |
| JUL 13-19           | 11.7  | 6.6  | 30  | 68.8  | 14.1  | 26  | 0     | 0     | 0   | 31.5  | 5.2   | 16  |
| JUL 20-26           | 13.9  | 2.2  | 17  | 53.8  | 18.7  | 13  | 0     | 0     | 0   | 150.5 | 50.5  | 3   |
| JUL 27-AUG2         | 40.8  | 15.5 | 15  | 22.6  | 7.1   | 20  | 0     | 0     | 0   | 0     | 0     | 0   |
| AUG 03-09           | 0     | 0    | 0   | 146.5 | 38.3  | 10  | 0     | 0     | 0   | 0     | 0     | 0   |
| AUG 10-16           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| AUG 17-23           | 25.7  | 7.4  | 6   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| AUG 24-30           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| AUG 31-SEP6         | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| SEP 07-13           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| SEP 14-20           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| MEAN                | 13.1  | 4.7  | 297 | 26.2  | 20.8  | 230 | 0     | 0     | 0   | 46.3  | 20.2  | 72  |
| AREA 3              |       |      |     |       |       |     |       |       |     |       |       |     |
| WEEK                | CPUE  | SE   | N   | CPUE  | SE    | N   | CPUE  | SE    | N   | CPUE  | SE    | N   |
| JUN 01-07           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 08-14           | 0     | 0    | 14  | 0     | 0     | 3   | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 15-21           | 3.4   | 0.7  | 52  | 0     | 0     | 65  | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 22-28           | 9.4   | 2.3  | 43  | 6.3   | 1.4   | 85  | 0     | 0     | 1   | 0     | 0     | 27  |
| JUN 29-JUL5         | 6.7   | 1.4  | 63  | 26.7  | 4.7   | 49  | 23.2  | 5.5   | 21  | 1.1   | 0.3   | 21  |
| JUL 06-12           | 7.1   | 1.9  | 44  | 77.3  | 15.9  | 39  | 78.6  | 18.3  | 28  | 50.4  | 22.4  | 16  |
| JUL 13-19           | 29.4  | 5.8  | 27  | 159   | 32.1  | 26  | 111.7 | 39.7  | 10  | 35    | 12.7  | 28  |
| JUL 20-26           | 34.5  | 27.4 | 41  | 153.5 | 41.1  | 15  | 209.4 | 56.1  | 13  | 145.7 | 40.9  | 11  |
| JUL 27-AUG2         | 148.5 | 29.3 | 63  | 597.4 | 118.4 | 21  | 236.5 | 65.1  | 18  | 420.2 | 197.6 | 10  |
| AUG 03-09           | 49.9  | 3.5  | 25  | 596.7 | 100.6 | 21  | 161.7 | 33.7  | 26  | 788.1 | 243.5 | 13  |
| AUG 10-16           | 212   | 57.1 | 15  | 262   | 52.8  | 19  | 214.4 | 35.7  | 29  | 295.4 | 100.2 | 9   |
| AUG 17-23           | 0     | 0    | 0   | 0     | 0     | 0   | 163.8 | 32.5  | 22  | 245.8 | 34.7  | 23  |
| AUG 24-30           | 0     | 0    | 0   | 0     | 0     | 0   | 86.4  | 14.1  | 36  | 59.8  | 15.1  | 19  |
| AUG 31-SEP6         | 237.6 | 53.5 | 18  | 0     | 0     | 0   | 154   | 49    | 2   | 39    | 0     | 1   |
| SEP 07-13           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| SEP 14-20           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| MEAN                | 58.4  | 21.6 | 405 | 108.4 | 42.6  | 343 | 137   | 34.5  | 206 | 171   | 93.8  | 183 |
| AREA 4              |       |      |     |       |       |     |       |       |     |       |       |     |
| WEEK                | CPUE  | SE   | N   | CPUE  | SE    | N   | CPUE  | SE    | N   | CPUE  | SE    | N   |
| JUN 01-07           | 0     | 0    | 21  | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 08-14           | 0     | 0    | 44  | 0     | 0     | 10  | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 15-21           | 0.1   | 0.1  | 31  | 1.3   | 0.7   | 31  | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 22-28           | 0     | 0    | 48  | 3.8   | 1     | 30  | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 29-JUL5         | 0.3   | 0.1  | 30  | 1.8   | 0.4   | 29  | 4.9   | 1.5   | 23  | 0.8   | 0.3   | 14  |
| JUL 06-12           | 11.1  | 2.9  | 26  | 13.8  | 5     | 17  | 6.2   | 2     | 19  | 2     | 0.5   | 14  |
| JUL 13-19           | 9.5   | 2.8  | 15  | 54.1  | 15.3  | 25  | 57.8  | 18    | 6   | 21.6  | 9     | 8   |
| JUL 20-26           | 44.4  | 13.1 | 11  | 63.6  | 15.7  | 33  | 50.7  | 17.3  | 10  | 35.9  | 13.3  | 10  |
| JUL 27-AUG2         | 239.5 | 75   | 8   | 230.9 | 62    | 16  | 49.3  | 19.6  | 6   | 109.4 | 28.8  | 16  |
| AUG 03-09           | 129.7 | 24.2 | 15  | 275.5 | 68    | 20  | 261   | 83.3  | 9   | 424.2 | 133.3 | 9   |
| AUG 10-16           | 248.7 | 35.2 | 7   | 963.6 | 523.6 | 15  | 119.1 | 61    | 10  | 513.6 | 127.7 | 5   |
| AUG 17-23           | 406.3 | 63.2 | 17  | 0     | 0     | 0   | 7.5   | 4.5   | 2   | 254.6 | 52.1  | 7   |
| AUG 24-30           | 191.2 | 64.9 | 10  | 0     | 0     | 0   | 101.4 | 36.5  | 8   | 177   | 36.9  | 15  |
| AUG 31-SEP6         | 105.6 | 24.7 | 17  | 0     | 0     | 0   | 16.3  | 15.3  | 3   | 16.3  | 5.2   | 3   |
| SEP 07-13           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 11.3  | 4.2   | 9   |
| SEP 14-20           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| MEAN                | 53.6  | 24   | 320 | 121.9 | 137.6 | 226 | 60.4  | 35.1  | 96  | 116.3 | 51.2  | 115 |
| AREA 5              |       |      |     |       |       |     |       |       |     |       |       |     |
| WEEK                | CPUE  | SE   | N   | CPUE  | SE    | N   | CPUE  | SE    | N   | CPUE  | SE    | N   |
| JUN 01-07           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 08-14           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 15-21           | 0     | 0    | 27  | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 22-28           | 0     | 0    | 25  | 11.7  | 4.6   | 6   | 0     | 0     | 0   | 0     | 0     | 0   |
| JUN 29-JUL5         | 0     | 0    | 19  | 12.8  | 4.7   | 10  | 20.6  | 7.2   | 7   | 0.3   | 0.2   | 6   |
| JUL 06-12           | 3.3   | 1.3  | 26  | 172.6 | 119.2 | 7   | 16.9  | 3.1   | 36  | 5.9   | 2.6   | 11  |
| JUL 13-19           | 12.7  | 4.2  | 14  | 0     | 0     | 0   | 33.4  | 14.2  | 7   | 90.9  | 25.8  | 7   |
| JUL 20-26           | 30.1  | 16.4 | 19  | 0     | 0     | 0   | 142   | 97.5  | 7   | 151.3 | 22.6  | 9   |
| JUL 27-AUG2         | 57.8  | 10.7 | 56  | 0     | 0     | 0   | 198   | 198   | 2   | 214.5 | 54.2  | 2   |
| AUG 03-09           | 167.9 | 18.5 | 40  | 0     | 0     | 0   | 241.3 | 132.4 | 4   | 508.6 | 158.8 | 2   |
| AUG 10-16           | 187.7 | 46.5 | 15  | 0     | 0     | 0   | 423   | 212.2 | 3   | 660   | 0     | 0   |
| AUG 17-23           | 105.7 | 11.9 | 3   | 0     | 0     | 0   | 482   | 178.7 | 5   | 593.5 | 191.5 | 0   |
| AUG 24-30           | 316.2 | 92.3 | 11  | 0     | 0     | 0   | 226   | 164.8 | 7   | 365.8 | 124   | 0   |
| AUG 31-SEP6         | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| SEP 07-13           | 72.8  | 18.3 | 8   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| SEP 14-20           | 0     | 0    | 0   | 0     | 0     | 0   | 0     | 0     | 0   | 0     | 0     | 0   |
| MEAN                | 68.4  | 24.3 | 263 | 61.1  | 65.9  | 25  | 110.3 | 94.9  | 78  | 184.1 | 75.9  | 32  |

Appendix 1. (continued).

| CHUM CATCH BY SEINE |      |      |     |      |      |     |      |      |     |      |      |      |    |  |  |
|---------------------|------|------|-----|------|------|-----|------|------|-----|------|------|------|----|--|--|
| 1982                |      |      |     | 1983 |      |     |      | 1984 |     |      |      | 1985 |    |  |  |
| AREA 1              | WEEK | CPUE | SE  | N    | CPUE | SE  | N    | CPUE | SE  | N    | CPUE | SE   | N  |  |  |
| JUN 01-07           | 0.7  | 0.6  | 7   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 08-14           | 1.2  | 0.3  | 61  | 7.4  | 2.6  | 18  | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 15-21           | 0.6  | 0.1  | 58  | 10.3 | 2.3  | 29  | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 22-28           | 1.5  | 0.3  | 48  | 7.3  | 1.5  | 35  | 0    | 0    | 0   | 0    | 5.7  | 1.6  | 19 |  |  |
| JUN 29-JUL5         | 6.4  | 1.5  | 38  | 5.5  | 1    | 45  | 0    | 0    | 0   | 0    | 8.4  | 2.2  | 21 |  |  |
| JUL 06-12           | 18.5 | 6.5  | 19  | 7.2  | 0.8  | 34  | 0    | 0    | 0   | 0    | 2.6  | 0.5  | 17 |  |  |
| JUL 13-19           | 22.6 | 4.5  | 30  | 5.1  | 1.1  | 26  | 0    | 0    | 0   | 0    | 5.4  | 1.1  | 16 |  |  |
| JUL 20-26           | 16.7 | 4.3  | 17  | 1.1  | 0.3  | 13  | 0    | 0    | 0   | 0    | 10.5 | 3.2  | 9  |  |  |
| JUL 27-AUG2         | 15.2 | 5.6  | 15  | 0.7  | 0.3  | 20  | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| AUG 03-09           | 0    | 0    | 0   | 3.9  | 1.5  | 10  | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| AUG 10-16           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| AUG 17-23           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| AUG 24-30           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| AUG 31-SEP6         | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| SEP 07-13           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| SEP 14-20           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| MEAN                | 6.5  | 2.7  | 297 | 6    | 1.4  | 230 | 0    | 0    | 0   | 5.8  | 1.9  | 75   |    |  |  |
| AREA 3              | WEEK | CPUE | SE  | N    | CPUE | SE  | N    | CPUE | SE  | N    | CPUE | SE   | N  |  |  |
| JUN 01-07           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 08-14           | 0.3  | 0.2  | 14  | 0.7  | 0.7  | 3   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 15-21           | 0.5  | 0.2  | 52  | 7.7  | 1.3  | 65  | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 22-28           | 1.9  | 0.4  | 43  | 4.8  | 0.7  | 85  | 7    | 0    | 1   | 2.7  | 0.6  | 27   |    |  |  |
| JUN 29-JUL5         | 2.8  | 0.5  | 63  | 12   | 4    | 49  | 21.9 | 5.3  | 21  | 4.6  | 1.4  | 21   |    |  |  |
| JUL 06-12           | 1.7  | 0.3  | 44  | 6.1  | 1.2  | 39  | 32.8 | 4.8  | 28  | 16.8 | 8.4  | 15   |    |  |  |
| JUL 13-19           | 3.4  | 0.7  | 27  | 11.7 | 2.3  | 26  | 14.7 | 4.8  | 10  | 7.3  | 1.2  | 28   |    |  |  |
| JUL 20-26           | 4.2  | 1.1  | 41  | 3.9  | 1.7  | 15  | 21   | 6.6  | 13  | 5.2  | 3.9  | 11   |    |  |  |
| JUL 27-AUG2         | 5.2  | 1.1  | 63  | 6.7  | 2.2  | 21  | 11.4 | 3.7  | 18  | 8.2  | 2.7  | 10   |    |  |  |
| AUG 03-09           | 1.6  | 0.4  | 25  | 5    | 1    | 21  | 4.9  | 1.6  | 26  | 12.9 | 4.6  | 18   |    |  |  |
| AUG 10-16           | 2.5  | 1.3  | 15  | 2.5  | 0.7  | 19  | 7.1  | 3    | 29  | 4.7  | 2.5  | 9    |    |  |  |
| AUG 17-23           | 0    | 0    | 0   | 0    | 0    | 0   | 2.9  | 0.9  | 22  | 10.6 | 3.1  | 23   |    |  |  |
| AUG 24-30           | 0    | 0    | 0   | 0    | 0    | 0   | 3.6  | 0.8  | 36  | 6.1  | 1.2  | 19   |    |  |  |
| AUG 31-SEP6         | 4.8  | 1.7  | 18  | 0    | 0    | 0   | 4    | 2    | 2   | 5    | 0    | 1    |    |  |  |
| SEP 07-13           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    |    |  |  |
| SEP 14-20           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    |    |  |  |
| MEAN                | 2.8  | 0.8  | 405 | 7    | 2    | 343 | 12.4 | 3.6  | 206 | 7.2  | 3.4  | 193  |    |  |  |
| AREA 4              | WEEK | CPUE | SE  | N    | CPUE | SE  | N    | CPUE | SE  | N    | CPUE | SE   | N  |  |  |
| JUN 01-07           | 0.1  | 0.1  | 21  | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 08-14           | 0.2  | 0.1  | 44  | 0.7  | 0.3  | 10  | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 15-21           | 0.6  | 0.2  | 51  | 4.3  | 1    | 31  | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 22-28           | 0.4  | 0.1  | 48  | 0.8  | 0.3  | 30  | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 29-JUL5         | 2.3  | 0.6  | 30  | 0.8  | 0.4  | 29  | 2    | 0.7  | 23  | 0.5  | 0.2  | 14   |    |  |  |
| JUL 06-12           | 1.5  | 0.3  | 26  | 2.9  | 0.9  | 17  | 2.1  | 0.7  | 19  | 0.9  | 0.3  | 14   |    |  |  |
| JUL 13-19           | 0.3  | 0.3  | 15  | 2.9  | 1.1  | 25  | 7.3  | 2.7  | 6   | 0.8  | 0.4  | 8    |    |  |  |
| JUL 20-26           | 6.8  | 2    | 11  | 0.8  | 0.3  | 33  | 5.2  | 2.4  | 10  | 1.2  | 0.9  | 10   |    |  |  |
| JUL 27-AUG2         | 2.8  | 0.6  | 8   | 0.6  | 0.3  | 16  | 6.3  | 3.9  | 6   | 1.4  | 0.7  | 16   |    |  |  |
| AUG 03-09           | 4.9  | 1.6  | 15  | 0.4  | 0.2  | 20  | 4.3  | 1.7  | 9   | 0.8  | 0.4  | 9    |    |  |  |
| AUG 10-16           | 14.4 | 6.1  | 7   | 0.7  | 0.2  | 15  | 1.5  | 0.5  | 10  | 1.8  | 0.4  | 5    |    |  |  |
| AUG 17-23           | 5.8  | 1    | 17  | 0    | 0    | 0   | 1    | 1    | 2   | 1    | 0.6  | 7    |    |  |  |
| AUG 24-30           | 4.5  | 1    | 10  | 0    | 0    | 0   | 1.4  | 0.8  | 8   | 3    | 1.3  | 15   |    |  |  |
| AUG 31-SEP6         | 4.4  | 1.1  | 17  | 0    | 0    | 0   | 0    | 0    | 3   | 0.6  | 0.2  | 8    |    |  |  |
| SEP 07-13           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0.8  | 0.5  | 9    |    |  |  |
| SEP 14-20           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    |    |  |  |
| MEAN                | 2.1  | 1.1  | 320 | 1.6  | 0.6  | 226 | 3    | 1.6  | 96  | 1.2  | 0.7  | 115  |    |  |  |
| AREA 5              | WEEK | CPUE | SE  | N    | CPUE | SE  | N    | CPUE | SE  | N    | CPUE | SE   | N  |  |  |
| JUN 01-07           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 08-14           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 15-21           | 0    | 0    | 27  | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 22-28           | 0.1  | 0.1  | 25  | 18   | 6.5  | 6   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| JUN 29-JUL5         | 0.1  | 0.1  | 19  | 16.3 | 3.7  | 10  | 6    | 2.9  | 7   | 1    | 0.8  | 0    | 0  |  |  |
| JUL 06-12           | 0.4  | 0.2  | 26  | 9.9  | 3.9  | 7   | 8.2  | 2.2  | 36  | 0.9  | 3.5  | 11   | 0  |  |  |
| JUL 13-19           | 1.2  | 0.6  | 14  | 0    | 0    | 0   | 10.7 | 2.7  | 7   | 1.9  | 0.8  | 9    | 0  |  |  |
| JUL 20-26           | 0.8  | 0.3  | 19  | 0    | 0    | 0   | 1.4  | 0.6  | 7   | 4.2  | 1.1  | 9    | 0  |  |  |
| JUL 27-AUG2         | 1.3  | 0.5  | 36  | 0    | 0    | 0   | 1.5  | 1.5  | 2   | 3.7  | 1.2  | 9    | 0  |  |  |
| AUG 03-09           | 4.6  | 1.4  | 40  | 0    | 0    | 0   | 0    | 0    | 4   | 0.8  | 3.5  | 6    | 0  |  |  |
| AUG 10-16           | 8.7  | 5.5  | 15  | 0    | 0    | 0   | 0    | 0    | 3   | 2    | 0.6  | 6    | 0  |  |  |
| AUG 17-23           | 0.7  | 0.7  | 3   | 0    | 0    | 0   | 2.8  | 1.7  | 5   | 4.5  | 3.5  | 3    | 0  |  |  |
| AUG 24-30           | 1.1  | 0.3  | 11  | 0    | 0    | 0   | 1.1  | 0.6  | 7   | 3    | 3.4  | 3    | 0  |  |  |
| AUG 31-SEP6         | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| SEP 07-13           | 1.4  | 0.6  | 8   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| SEP 14-20           | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0   | 0    | 0    | 0    | 0  |  |  |
| MEAN                | 1.7  | 1.4  | 263 | 14.8 | 4.6  | 23  | 5.7  | 2    | 78  | 2.3  | 0.8  | 25   | 0  |  |  |

## STEELHEAD CATCH BY SEINE

| 1982   |              |      |     | 1983 |      |     |     | 1984 |    |   |      | 1985 |    |  |  |
|--------|--------------|------|-----|------|------|-----|-----|------|----|---|------|------|----|--|--|
| AREA 1 | WEEK         | CPUE | SE  | N    | CPUE | SE  | N   | CPUE | SE | N | CPUE | SE   | N  |  |  |
|        | JUN 01-07    | 0.2  | 0.2 | 7    | 0    | 0   | 0   | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | JUN 08-14    | 0.1  | 0   | 51   | 0.2  | 0.1 | 18  | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | JUN 15-21    | 0    | 0   | 58   | 0.2  | 0.1 | 29  | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | JUN 22-28    | 0.1  | 0   | 48   | 0.5  | 0.1 | 35  | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | JUN 29-JUL 5 | 0.5  | 0.1 | 38   | 0.3  | 0.1 | 45  | 0    | 0  | 0 | 0.1  | 0.1  | 19 |  |  |
|        | JUL 06-12    | 0.3  | 0.2 | 19   | 1.2  | 0.3 | 34  | 0    | 0  | 0 | 0.2  | 0.1  | 17 |  |  |
|        | JUL 13-19    | 0.2  | 0.1 | 30   | 0.3  | 0.1 | 26  | 0    | 0  | 0 | 0.1  | 0.1  | 11 |  |  |
|        | JUL 20-26    | 0.3  | 0.2 | 17   | 0.1  | 0.1 | 13  | 0    | 0  | 0 | 0    | 0    | 3  |  |  |
|        | JUL 27-AUG 2 | 0.2  | 0.2 | 13   | 0.2  | 0.1 | 20  | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | AUG 03-09    | 0    | 0   | 0    | 0.1  | 0.1 | 10  | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | AUG 10-16    | 0    | 0   | 0    | 0    | 0   | 0   | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | AUG 17-23    | 0    | 0   | 6    | 0    | 0   | 0   | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | AUG 24-30    | 0    | 0   | 0    | 0    | 0   | 0   | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | AUG 31-SEP 6 | 0    | 0   | 0    | 0    | 0   | 0   | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | SEP 07-13    | 0    | 0   | 0    | 0    | 0   | 0   | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | SEP 14-20    | 0    | 0   | 0    | 0    | 0   | 0   | 0    | 0  | 0 | 0    | 0    | 0  |  |  |
|        | MEAN         | 0.2  | 0.1 | 297  | 0.4  | 0.1 | 230 | 0    | 0  | 0 | 0.1  | 0.1  | 77 |  |  |

| AREA 3 | WEEK         | CPUE | SE  | N   | CPUE | SE  | N   | CPUE | SE  | N   | CPUE | SE  | N   |
|--------|--------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
|        | JUN 01-07    | 0    | 0   | 0   | 0    | 0   | 0   | 0    | 0   | 0   | 0    | 0   | 0   |
|        | JUN 08-14    | 0    | 0   | 14  | 0.3  | 0.3 | 3   | 0    | 0   | 0   | 0    | 0   | 0   |
|        | JUN 15-21    | 0    | 0   | 52  | 0    | 0   | 65  | 0    | 0   | 0   | 0    | 0   | 0   |
|        | JUN 22-28    | 0    | 0   | 47  | 0    | 0   | 85  | 1    | 0   | 1   | 0    | 0   | 0   |
|        | JUN 29-JUL 5 | 0.1  | 0   | 67  | 0.8  | 0.7 | 49  | 0    | 0   | 21  | 0.2  | 0.2 | 27  |
|        | JUL 06-12    | 0    | 0   | 44  | 0.1  | 0.1 | 39  | 0    | 0   | 28  | 0.1  | 0.1 | 16  |
|        | JUL 13-19    | 0.4  | 0.1 | 27  | 0.1  | 0.1 | 26  | 0.3  | 0.2 | 10  | 0.2  | 0.1 | 28  |
|        | JUL 20-26    | 0.2  | 0.1 | 41  | 0    | 0   | 15  | 0.1  | 0.1 | 13  | 0.1  | 0.1 | 11  |
|        | JUL 27-AUG 2 | 0.6  | 0.2 | 63  | 0.1  | 0.1 | 21  | 0.2  | 0.2 | 18  | 0.2  | 0.1 | 10  |
|        | AUG 03-09    | 0.8  | 0.3 | 25  | 0.8  | 0.3 | 21  | 0.2  | 0.1 | 26  | 0.3  | 0.2 | 18  |
|        | AUG 10-16    | 1.2  | 0.7 | 15  | 1.1  | 0.5 | 19  | 0.3  | 0.2 | 29  | 0.6  | 0.3 | 9   |
|        | AUG 17-23    | 0    | 0   | 0   | 0    | 0   | 0   | 0.2  | 0.1 | 22  | 0.4  | 0.2 | 23  |
|        | AUG 24-30    | 0    | 0   | 0   | 0    | 0   | 0   | 0.3  | 0.1 | 26  | 0.3  | 0.1 | 19  |
|        | AUG 31-SEP 6 | 0.2  | 0.1 | 18  | 0    | 0   | 0   | 0    | 0   | 0   | 0    | 0   | 0   |
|        | SEP 07-13    | 0    | 0   | 0   | 0    | 0   | 0   | 0    | 0   | 0   | 0    | 0   | 0   |
|        | SEP 14-20    | 0    | 0   | 0   | 0    | 0   | 0   | 0    | 0   | 0   | 0    | 0   | 0   |
|        | MEAN         | 0.3  | 0.2 | 405 | 0.3  | 0.3 | 343 | 0.2  | 0.1 | 206 | 0.2  | 0.1 | 183 |

| AREA 4 | WEEK         | CPUE | SE  | N   | CPUE | SE  | N   | CPUE | SE  | N  | CPUE | SE  | N   |
|--------|--------------|------|-----|-----|------|-----|-----|------|-----|----|------|-----|-----|
|        | JUN 01-07    | 0    | 0   | 21  | 0    | 0   | 0   | 0    | 0   | 0  | 0    | 0   | 0   |
|        | JUN 08-14    | 0    | 0   | 44  | 0    | 0   | 10  | 0    | 0   | 0  | 0    | 0   | 0   |
|        | JUN 15-21    | 0    | 0   | 51  | 0.1  | 0   | 31  | 0    | 0   | 0  | 0    | 0   | 0   |
|        | JUN 22-28    | 0    | 0   | 48  | 0    | 0   | 30  | 0    | 0   | 0  | 0    | 0   | 0   |
|        | JUN 29-JUL 5 | 0.1  | 0   | 30  | 0.1  | 0.1 | 29  | 0    | 0   | 23 | 0    | 0   | 14  |
|        | JUL 06-12    | 0    | 0   | 26  | 0.2  | 0.1 | 17  | 0    | 0   | 19 | 0    | 0   | 14  |
|        | JUL 13-19    | 0.1  | 0.1 | 15  | 0.2  | 0.1 | 25  | 0.2  | 0.2 | 6  | 1    | 0.5 | 8   |
|        | JUL 20-26    | 0    | 0   | 11  | 0.2  | 0.1 | 33  | 0.5  | 0.3 | 10 | 0.6  | 0.3 | 10  |
|        | JUL 27-AUG 2 | 0    | 0   | 8   | 0    | 0   | 16  | 0.2  | 0.2 | 6  | 1.9  | 0.7 | 16  |
|        | AUG 03-09    | 0.1  | 0.1 | 15  | 0.3  | 0.2 | 20  | 0.3  | 0.2 | 9  | 0.2  | 0.1 | 9   |
|        | AUG 10-16    | 0.1  | 0.1 | 7   | 0.4  | 0.2 | 15  | 0.2  | 0.2 | 10 | 1.2  | 0.7 | 5   |
|        | AUG 17-23    | 0.2  | 0.1 | 17  | 0    | 0   | 0   | 0    | 0   | 2  | 0.9  | 0.7 | 7   |
|        | AUG 24-30    | 0.1  | 0.1 | 10  | 0    | 0   | 0   | 0.3  | 0.2 | 9  | 0.9  | 0.3 | 15  |
|        | AUG 31-SEP 6 | 0    | 0   | 17  | 0    | 0   | 0   | 0    | 0   | 3  | 0.4  | 0.3 | 8   |
|        | SEP 07-13    | 0    | 0   | 0   | 0    | 0   | 0   | 0    | 0   | 0  | 0.8  | 0.3 | 9   |
|        | SEP 14-20    | 0    | 0   | 0   | 0    | 0   | 0   | 0    | 0   | 0  | 0    | 0   | 0   |
|        | MEAN         | 0    | 0   | 320 | 0.1  | 0.1 | 226 | 0.1  | 0.2 | 96 | 0.7  | 0.4 | 115 |

| AREA 5 | WEEK         | CPUE | SE  | N   | CPUE | SE  | N  | CPUE | SE  | N  | CPUE | SE  | N  |
|--------|--------------|------|-----|-----|------|-----|----|------|-----|----|------|-----|----|
|        | JUN 01-07    | 0    | 0   | 0   | 0    | 0   | 0  | 0    | 0   | 0  | 0    | 0   | 0  |
|        | JUN 08-14    | 0    | 0   | 0   | 0    | 0   | 0  | 0    | 0   | 0  | 0    | 0   | 0  |
|        | JUN 15-21    | 0    | 0   | 27  | 0    | 0   | 0  | 0    | 0   | 0  | 0    | 0   | 0  |
|        | JUN 22-28    | 0.1  | 0.1 | 25  | 0.2  | 0.2 | 6  | 0    | 0   | 0  | 0    | 0   | 0  |
|        | JUN 29-JUL 5 | 0.1  | 0.1 | 19  | 0.3  | 0.2 | 10 | 0.1  | 0.1 | 7  | 0.2  | 0.2 | 6  |
|        | JUL 06-12    | 0    | 0   | 26  | 0.3  | 0.2 | 7  | 0.1  | 0   | 36 | 0    | 0   | 11 |
|        | JUL 13-19    | 0.3  | 0.2 | 14  | 0    | 0   | 0  | 0.4  | 0.2 | 7  | 0.4  | 0.2 | 7  |
|        | JUL 20-26    | 0.3  | 0.1 | 19  | 0    | 0   | 0  | 0    | 0   | 7  | 0.7  | 0.2 | 9  |
|        | JUL 27-AUG 2 | 0.1  | 0.1 | 56  | 0    | 0   | 0  | 0    | 0   | 2  | 1    | 0.7 | 6  |
|        | AUG 03-09    | 0.1  | 0   | 40  | 0    | 0   | 0  | 0.5  | 0.3 | 4  | 0.2  | 0.2 | 5  |
|        | AUG 10-16    | 0    | 0   | 15  | 0    | 0   | 0  | 0    | 0   | 3  | 0    | 0   | 0  |
|        | AUG 17-23    | 0    | 0   | 3   | 0    | 0   | 0  | 0.2  | 0.2 | 5  | 3.5  | 3.5 | 0  |
|        | AUG 24-30    | 0.1  | 0.1 | 11  | 0    | 0   | 0  | 0    | 0   | 7  | 0.4  | 0.4 | 0  |
|        | AUG 31-SEP 6 | 0    | 0   | 0   | 0    | 0   | 0  | 0    | 0   | 0  | 0    | 0   | 0  |
|        | SEP 07-13    | 0.3  | 0.2 | 8   | 0    | 0   | 0  | 0    | 0   | 0  | 0    | 0   | 0  |
|        | SEP 14-20    | 0    | 0   | 0   | 0    | 0   | 0  | 0    | 0   | 0  | 0    | 0   | 0  |
|        | MEAN         | 0.1  | 0.1 | 263 | 0.3  | 0.2 | 23 | 0.1  | 0.1 | 78 | 0.5  | 0.1 | 22 |

Appendix 2. Catch of pink, chinook, chum, sockeye and coho salmon and steelhead trout by seine tagging vessels by week for statistical area 6 in 1985. CPUE, SE and N refer to catch-per-unit-of-effort, standard error of the CPUE and the number of sets respectively.

CATCH OF ALL SPECIES IN AREA 6 SEINE 1985

| WEEK         | PINK   |       | CHIN |     | CHUM |      | SOCK |     | COHO |     | STEAD |    | N  |
|--------------|--------|-------|------|-----|------|------|------|-----|------|-----|-------|----|----|
|              | CPUE   | SE    | CPUE | SE  | CPUE | SE   | CPUE | SE  | CPUE | SE  | CPUE  | SE |    |
| JUN 01-07    | 0      | 0     | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0     | 0  | 0  |
| JUN 08-14    | 0      | 0     | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0     | 0  | 0  |
| JUN 15-21    | 0      | 0     | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0     | 0  | 0  |
| JUN 22-28    | 0      | 0     | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0     | 0  | 0  |
| JUN 29-JUL 5 | 15.7   | 5.5   | 5.7  | 1.9 | 28.3 | 5.9  | 10.3 | 2.9 | 0.7  | 0.5 | 0     | 0  | 6  |
| JUL 06-12    | 70.8   | 28    | 3.5  | 1.1 | 14.7 | 7.3  | 11.2 | 2.5 | 2.5  | 0.7 | 0     | 0  | 5  |
| JUL 13-19    | 165    | 82.2  | 2    | 1.1 | 36   | 10.4 | 17.3 | 9.4 | 5.3  | 2.5 | 0     | 0  | 4  |
| JUL 20-26    | 217.3  | 64    | 8    | 3   | 39   | 15.5 | 11.5 | 2.4 | 7    | 2.6 | 0     | 0  | 3  |
| JUL 27-AUG 2 | 134.5  | 30.5  | 1.5  | 1.5 | 43.5 | 1.5  | 8    | 5   | 9    | 1   | 0     | 0  | 2  |
| AUG 03-09    | 415.2  | 142.6 | 0.3  | 0.3 | 24   | 6.8  | 9.7  | 2.9 | 12.2 | 4.5 | 0     | 0  | 5  |
| AUG 10-16    | 0      | 0     | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0     | 0  | 0  |
| AUG 17-23    | 1004.5 | 45.5  | 0    | 0   | 29.5 | 9.5  | 6    | 0   | 29.5 | 0.5 | 0     | 0  | 2  |
| AUG 24-30    | 406    | 0     | 0    | 0   | 13   | 0    | 4    | 0   | 10   | 0   | 0     | 0  | 1  |
| AUG 31-SEP 6 | 0      | 0     | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0     | 0  | 0  |
| SEP 07-13    | 0      | 0     | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0     | 0  | 0  |
| SEP 14-20    | 0      | 0     | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0     | 0  | 0  |
| MEAN         | 233.5  | 75.8  | 3.1  | 1.5 | 27.4 | 8.4  | 10.7 | 4.3 | 7.4  | 2.4 | 0     | 0  | 30 |

Appendix 3. Catch of sockeye, pink and chum salmon and steelhead trout by the troll tagging vessels by week for statistical area 1 in 1982, 1984 and 1985. CPUE, SE and N refer to catch-per-unit-of-effort, standard error of the CPUE and the number of tacks respectively.

| AREA 1 TROLL CATCH |      |      |     |      |    |   |      |      |     |      |      |      |      |    |   |
|--------------------|------|------|-----|------|----|---|------|------|-----|------|------|------|------|----|---|
| 1982               |      |      |     | 1983 |    |   |      | 1984 |     |      |      | 1985 |      |    |   |
| PINK               | CPUE | SE   | N   | CPUE | SE | N | CPUE | SE   | N   | CPUE | SE   | N    | CPUE | SE | N |
| WEEK               |      |      |     |      |    |   |      |      |     |      |      |      |      |    |   |
| JUN 01-07          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 08-14          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 15-21          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 22-28          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 29-JUL 5       | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUL 06-12          | 0    | 0    | 0   | 0    | 0  | 0 | 28.4 | 4.3  | 17  | 63.5 | 31.5 | 2    | 0    | 0  | 0 |
| JUL 13-19          | 17.2 | 2.3  | 48  | 0    | 0  | 0 | 25.3 | 2.3  | 105 | 5.7  | 1.5  | 3    | 0    | 0  | 0 |
| JUL 20-26          | 11.5 | 2.4  | 49  | 0    | 0  | 0 | 33.1 | 2.8  | 44  | 0    | 0    | 0    | 0    | 0  | 0 |
| JUL 27-AUG 2       | 66.9 | 10.8 | 45  | 0    | 0  | 0 | 46.1 | 4.2  | 88  | 28.7 | 3.5  | 35   | 0    | 0  | 0 |
| AUG 03-09          | 35.7 | 5.6  | 45  | 0    | 0  | 0 | 59.9 | 7.3  | 50  | 74.3 | 8.6  | 16   | 0    | 0  | 0 |
| AUG 10-16          | 40.6 | 5.4  | 86  | 0    | 0  | 0 | 77.5 | 6.1  | 75  | 202  | 0    | 1    | 0    | 0  | 0 |
| AUG 17-23          | 71.5 | 16.4 | 17  | 0    | 0  | 0 | 34.4 | 9.5  | 22  | 0    | 0    | 0    | 0    | 0  | 0 |
| AUG 24-30          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| AUG 31-SEP 6       | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| SEP 07-13          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| SEP 14-20          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| MEAN               | 36.9 | 7    | 290 | 0    | 0  | 0 | 45.4 | 5    | 401 | 44.5 | 8    | 57   |      |    |   |
| SOCKEYE            |      |      |     |      |    |   |      |      |     |      |      |      |      |    |   |
|                    | CPUE | SE   | N   | CPUE | SE | N | CPUE | SE   | N   | CPUE | SE   | N    | CPUE | SE | N |
| JUN 01-07          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 08-14          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 15-21          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 22-28          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 29-JUL 5       | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUL 06-12          | 0    | 0    | 0   | 0    | 0  | 0 | 0.1  | 0.1  | 17  | 1.5  | 1.5  | 2    | 0    | 0  | 0 |
| JUL 13-19          | 0.6  | 0.2  | 48  | 0    | 0  | 0 | 0.7  | 0.2  | 105 | 0.3  | 0.3  | 3    | 0    | 0  | 0 |
| JUL 20-26          | 0.4  | 0.2  | 49  | 0    | 0  | 0 | 0.8  | 0.2  | 44  | 0    | 0    | 0    | 0    | 0  | 0 |
| JUL 27-AUG 2       | 0.1  | 0    | 45  | 0    | 0  | 0 | 0.5  | 0.1  | 88  | 0.9  | 0.2  | 35   | 0    | 0  | 0 |
| AUG 03-09          | 0.1  | 0    | 45  | 0    | 0  | 0 | 0.5  | 0.1  | 50  | 2.9  | 0.9  | 16   | 0    | 0  | 0 |
| AUG 10-16          | 0.1  | 0    | 86  | 0    | 0  | 0 | 0.1  | 0    | 75  | 3    | 0    | 1    | 0    | 0  | 0 |
| AUG 17-23          | 0.1  | 0.1  | 17  | 0    | 0  | 0 | 0.1  | 0.1  | 22  | 0    | 0    | 0    | 0    | 0  | 0 |
| AUG 24-30          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| AUG 31-SEP 6       | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| SEP 07-13          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| SEP 14-20          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| MEAN               | 0.2  | 0.1  | 290 | 0    | 0  | 0 | 0.5  | 0.1  | 401 | 1.5  | 0.6  | 57   |      |    |   |
| CHUM               |      |      |     |      |    |   |      |      |     |      |      |      |      |    |   |
|                    | CPUE | SE   | N   | CPUE | SE | N | CPUE | SE   | N   | CPUE | SE   | N    | CPUE | SE | N |
| JUN 01-07          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 08-14          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 15-21          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 22-28          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 29-JUL 5       | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUL 06-12          | 0    | 0    | 0   | 0    | 0  | 0 | 0.4  | 0.2  | 17  | 3    | 0    | 2    | 0    | 0  | 0 |
| JUL 13-19          | 0.1  | 0.1  | 48  | 0    | 0  | 0 | 1.5  | 0.3  | 105 | 0.3  | 0.3  | 3    | 0    | 0  | 0 |
| JUL 20-26          | 0.1  | 0    | 49  | 0    | 0  | 0 | 2.2  | 3.6  | 44  | 0    | 0    | 0    | 0    | 0  | 0 |
| JUL 27-AUG 2       | 0.3  | 0.1  | 45  | 0    | 0  | 0 | 2.5  | 0.3  | 88  | 1.9  | 0.3  | 35   | 0    | 0  | 0 |
| AUG 03-09          | 0.3  | 0.1  | 45  | 0    | 0  | 0 | 2.1  | 0.3  | 50  | 0.8  | 0.3  | 16   | 0    | 0  | 0 |
| AUG 10-16          | 0.4  | 0.1  | 86  | 0    | 0  | 0 | 2.1  | 0.2  | 75  | 24   | 0    | 1    | 0    | 0  | 0 |
| AUG 17-23          | 1.1  | 0.3  | 17  | 0    | 0  | 0 | 0.8  | 0.3  | 22  | 0    | 0    | 0    | 0    | 0  | 0 |
| AUG 24-30          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| AUG 31-SEP 6       | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| SEP 07-13          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| SEP 14-20          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| MEAN               | 0.3  | 0.1  | 290 | 0    | 0  | 0 | 1.9  | 0.3  | 401 | 1.9  | 0.3  | 57   |      |    |   |
| STEELHEAD          |      |      |     |      |    |   |      |      |     |      |      |      |      |    |   |
|                    | CPUE | SE   | N   | CPUE | SE | N | CPUE | SE   | N   | CPUE | SE   | N    | CPUE | SE | N |
| JUN 01-07          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 08-14          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 15-21          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 22-28          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUN 29-JUL 5       | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| JUL 06-12          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 17  | 0    | 0    | 2    | 0    | 0  | 0 |
| JUL 13-19          | 0    | 0    | 48  | 0    | 0  | 0 | 0    | 0    | 105 | 0    | 0    | 3    | 0    | 0  | 0 |
| JUL 20-26          | 0    | 0    | 49  | 0    | 0  | 0 | 0    | 0    | 44  | 0    | 0    | 0    | 0    | 0  | 0 |
| JUL 27-AUG 2       | 0    | 0    | 45  | 0    | 0  | 0 | 0.1  | 0    | 88  | 0.1  | 0.1  | 35   | 0    | 0  | 0 |
| AUG 03-09          | 0    | 0    | 45  | 0    | 0  | 0 | 0    | 0    | 50  | 0    | 0    | 16   | 0    | 0  | 0 |
| AUG 10-16          | 0    | 0    | 86  | 0    | 0  | 0 | 0    | 0    | 75  | 0    | 0    | 1    | 0    | 0  | 0 |
| AUG 17-23          | 0    | 0    | 17  | 0    | 0  | 0 | 0    | 0    | 22  | 0    | 0    | 0    | 0    | 0  | 0 |
| AUG 24-30          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| AUG 31-SEP 6       | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| SEP 07-13          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| SEP 14-20          | 0    | 0    | 0   | 0    | 0  | 0 | 0    | 0    | 0   | 0    | 0    | 0    | 0    | 0  | 0 |
| MEAN               | 0    | 0    | 290 | 0    | 0  | 0 | 0    | 0    | 401 | 0.1  | 0.1  | 57   |      |    |   |